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TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



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PHASE II REPORT

A study prepared for the
TOWNSEND COMMUNITY DEVELOPMENT PROGRAM
Ministry of Housing



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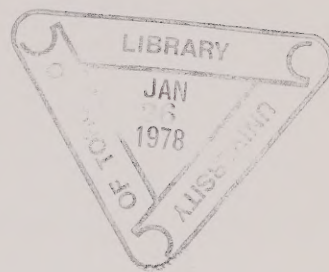


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BACKGROUND

1.00 INTRODUCTION

The planning program for the preparation of the Townsend plan is organized in three phases. Phase I, which was completed in March 1976, established agreement on development policies for the new town, determined in a general way the core area for urban development, and presented preliminary planning concepts.

In Phase II (April-September 1976) the strategic plan for a 100,000 population community was prepared together with the first development area, including proposals for major access and early servicing.

The final phase (October 1976-March 1977) will involve the preparation of a development program for a 20,000 community and a detailed plan for the first stage of development.

This report summarizes the results of the second phase work and presents the recommendations on the overall town plan and the first development area.

The basic assumptions and growth estimates are presented in Section 2.00, which also describes the requirements for housing, shopping, education, and special facilities at the different stages of the town's growth.

The site conditions, which were discussed in the Phase I report, are briefly reviewed in Section 3.00.

The recommendations are presented in three sections. The area selected for the first stage of development and its major components, such as the housing area,

the site for the regional administrative centre, the access road and early servicing arrangements, are described in Section 4.00.

The strategic plan for the whole town with the major use areas, town centre, road system, and open spaces, is explained in Section 5.00.

The agricultural areas in short and long term use are discussed in Section 6.00, which also makes recommendations for leasing arrangements to assure continued use for agricultural production.

Summary of Recommendations

The work carried out during Phase I of this study recommended the general location for both the final community of 100,000 and for a first phase plan for 20,000. During the course of this work three concept plans were prepared, each of which examined a variety of issues centering on different locations for the recommended development envelopes, the location of the town centre, alignments of Highways 6 and 3, and on the structure of the internal road system.

The focus of the Phase II work has been concerned with the detailed development of the concept plans in order to provide a firm proposal both for the short term (5,000 population) and long term (100,000 population) plans. The following are the key recommendations resulting from this work:

For the first stage development the key proposals for the accommodation of about 5,000 persons include:

- definition of about 200 ha (500 a) on the west side of the Nanticoke Creek for development
- realignment of Townline Road to the west of Nanticoke Creek to give access to the first development area from Highway 3
- location of temporary sewage facilities between Highway 3 and the railway line to serve development up to 1981
- definition of a site for the regional administrative centre on the east side of Townline Road adjoining the Nanticoke Creek

- definition of agricultural land use areas and recommended leasing arrangements to assure the continuation of farming.

The recommended long term plan for Townsend includes the following elements:

- definition of the townsite of about 2,700 ha (6,750 a) for urban uses, with the remaining 3,200 ha (7,850 a) of the designated land area left for agriculture
- location of the townsite generally centered on the Nanticoke Creek and extending westerly to the Black Creek
- location of a 90 ha (220 a) town centre west of Townline Road
- a network of new arterial roads and major collector streets forming a grid to provide good access to the town and within the town
- definition of two employment sites, off Highway 3 and south of the existing Livingston industrial area
- identification of major open space areas concentrated along the valleys and incorporating existing woodlots.

BACKGROUND

2.00 DEVELOPMENT BASE

The land use recommendations contained in the strategic plan are based upon a number of detailed social and economic projections. These projections describe the future resident population of Townsend, and their housing, shopping, recreation, and educational needs.

The data base has been prepared for three stages in the development of Townsend:

- 1) The short term, when Townsend will be at a 5,000 population level.
- 2) The medium term, when the community will have grown to 20,000 population.
- 3) The long term after 2001, when the community will reach its ultimate size of 100,000.

In all cases, the dates associated with the various population levels should be treated as target figures to indicate the general time frame being considered.

Because of the difficulty of making long term projections, most of the data base for the 100,000 population level is based upon the projections to 20,000 or to 80,000, which can be keyed to the year 2001.

2.10 Population Profile

The population profile developed for Townsend's early residents includes a first look at their age

characteristics, household size and income, and their religious/ethnic mix.

2.11 Population Growth

The population growth expected in the region will be due largely to the industrial development at Nanticoke. Nearly all of the new population in the area most likely will be drawn from throughout Ontario. Relatively little natural population increase is expected, nor is population expected to move to the Nanticoke area from other parts of the region.

860 new households are anticipated in the region in 1977; thereafter, the average yearly increase of households is expected to be: 1,042 between 1978-1980, 1,300 between 1981-1986, and 800 between 1987-2001.

The build-up of population in Townsend will be affected by a number of factors:

- the share of the total growth that can be concentrated in one area
- the required time needed for approvals and construction
- the current servicing capacities of the existing towns
- the feasible rate of construction especially in the early years
- local and provincial policies.

Three population targets have been set:

- 7,000 in mid-1981, which is determined by sanitary drainage constraints;
- 20,000 in mid-1986; and
- 80,000 at the turn of the century.

2.12 Age Characteristics

Because Townsend will accommodate in any case a high proportion of the regional growth generated by the Nanticoke development, the employers descriptions of their expected workforce have been used as the basis of this population profile.

The early Townsend residents are expected to be younger overall than the populations of Ontario and other urban communities. The young skilled workers probably will be drawn to the job opportunities and promotions at Nanticoke, whereas the older workers with job seniority and established roots are not expected to leave their current positions. As a result, at the 5,000 level 36% of the population are expected to be under 15 years of age and only 1% over 54, as compared

with figures of 24% and 18% for Ontario at a similar period. A similar pattern appears also at the 20,000 level (see figure 2.12 and table 2.12).

As Townsend grows in later years, it will take on the character of other urban centres. The existing residents will mature, a wider range of immigrant groups will be attracted from the region and elsewhere.

Most of the jobs in the early years most likely will be filled by workers with established skills rather than new employees in the labour force. Therefore, the natural rate of increase is not expected to be high as most of the households moving to Townsend will be families already with young children.

The age distribution over time for each of the three build-ups rates are similar except that the age groups under 34 are larger in the slower rates.

2.13 Household Size

The average persons per household is expected to be 3.55 in 1981 and 3.70 by 1986. Therefore, the 5,000 population will contain approximately 1,400 households, the 20,000 about 5,400.

The increase in the average size of household is counter to the provincial pattern, but is expected to occur due to the considerably different age structure in Townsend.

TABLE 2.12
Age Profile of Townsend and Ontario

Age Grouping	Townsend (population)			Ontario*		
	5,000	20,000	80,000	1981	1986	2001
0-14	36	33	26	24	25	27
15-34	43	43	39	35	33	29
35-54	20	22	29	23	24	25
55+	1	2	6	18	18	19
TOTAL	100	100	100	100	100	100

* based upon TEIGA projections

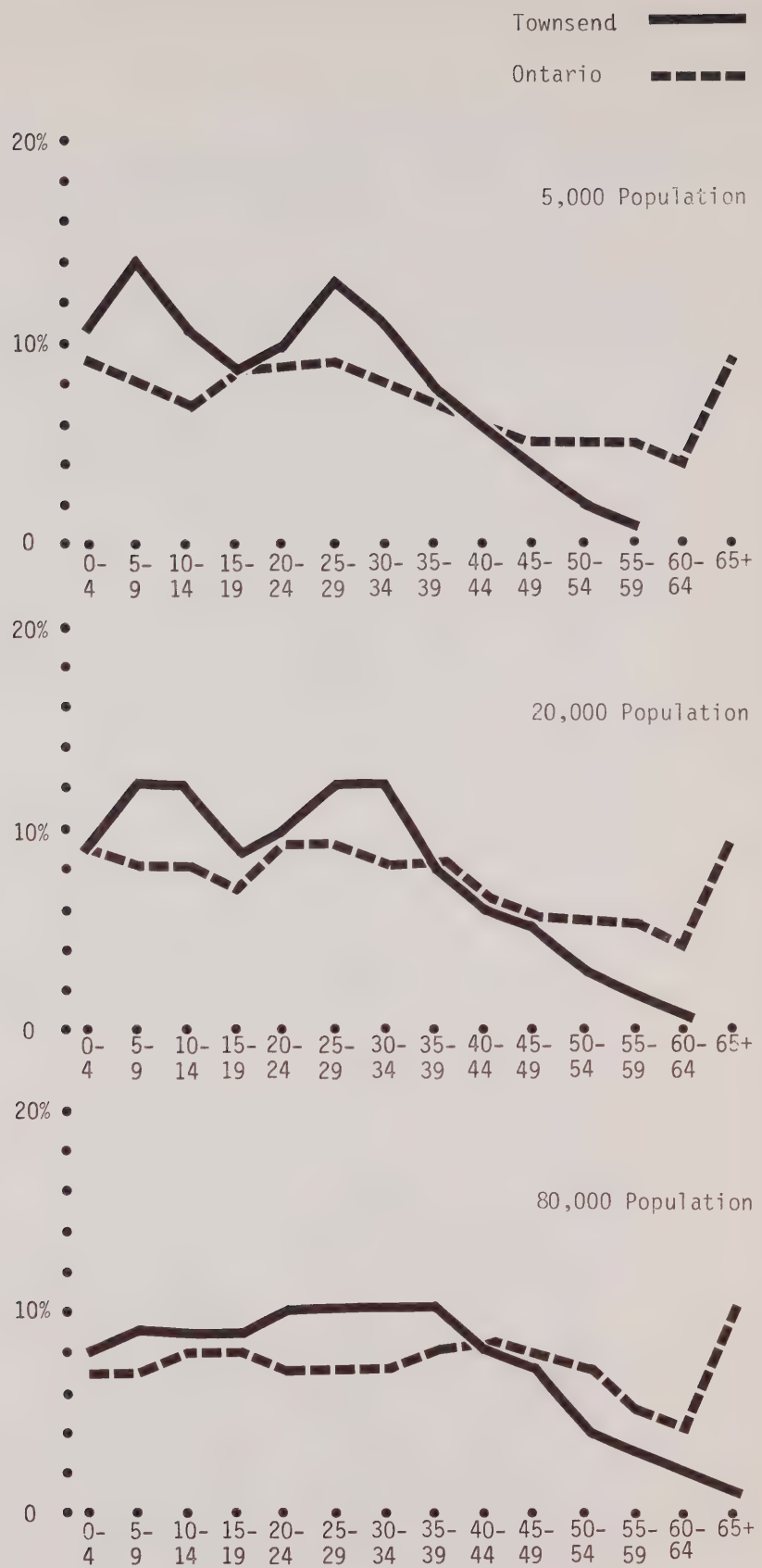


Figure 2.12

Age Profiles for Townsend and Ontario

2.14 Household Income

The bulk of Townsend's households in the early years will have single-wage earners in the middle-income bracket. This is due to the skilled employment opportunities for the primary wage earners, and lack of opportunities in the early years for second-wage earners. (See Table 2.14.) The household profiles have about 44% of the households earning more than \$15,000 annually in 1981 and 42% in 1986, using constant 1976 dollars. The average household income for these two dates is about \$14,750 and \$14,500 respectively.

In Townsend's early years the work opportunities for women, and other second-wage earners is expected to be less than the provincial average, and the majority of their jobs will be in relatively poor paying jobs in the service sector. In the later years, the work opportunities will increase and diversify, and the proportion of women working will most likely rise to near the provincial average at that time.

The 1981 household incomes will be slightly higher than the 1986 incomes using constant 1976 dollars, because of the nature of the employment. Initially, the jobs will be skilled and relatively well-paying industrial and construction jobs. As Townsend grows, however, there will be a large increase in the number of service

Table 2.14
Projected Incomes in Townsend

Incomes (constant 1976 \$)	Primary Income only		Total Household Income	
	1981	1986	1981	1986
\$10,000 or less	14	19	11	15
\$10,000-14,999	46	43	45	43
\$15,000-19,999	32	30	32	30
\$20,000 or more	8	8	12	12
TOTAL	100%	100%	100%	100%

jobs, that are traditionally lower paying. The result is that despite increased opportunities for second-income earners, the overall household income profile will be slightly lower in 1986 than in 1981.

As Townsend matures, the household incomes will become closer to the provincial average.

2.15 Religious/Ethnic Mix

The initial residents will be primarily skilled workers drawn probably from other industrialized urban areas throughout the province. The population characteristics of these areas have been influenced by recent immigration patterns to Canada. The proportion of Roman Catholics has been steadily increasing in these areas and the proportion of the population originally from the British Isles declining.

Townsend is expected, initially at least, to have a similar religious and ethnic composition with about 30% of the population Roman Catholic and about 60% originating from the British Isles.

This religious and ethnic composition will differ somewhat from the present mix in the region.

2.20 Housing Requirements

The housing types have been projected for the early population targets, using the household characteristics of the incoming population, their likely housing preferences, and prevalent house prices in the region. These housing projections have been used to estimate the residential land required in the plan.

2.21 Housing Types

The projected household characteristics have been converted into housing demand using these consumer preferences:

1. All households will seek the maximum cost unit they can afford.
2. Households with two or more persons will prefer ground-related single-detached dwellings, if they can afford one. Of these households, those that cannot afford to purchase a townhouse will wish to rent one in preference to an apartment.
3. Single person households will prefer to live in an apartment, or the unit type with least maintenance. All apartments will be rental.

In addition, the analysis of housing demand also included consideration of the average net incomes for varying size of family groups; the maximum amount spent for housing by various income and family size groups; and the current prices of new housing in urban areas of the Haldimand-Norfolk region.

The projected mix of house types has been made for the 5,000 and 20,000 population levels. (See table 2.21a.) They use a common range of house types; it can be expected that a greater diversity of types will be actually built. They are based upon conventional servicing standards and lot sizes used in the region.

The mix recommended for the 5,000 only is based upon a 5% drop from the current market levels in the region (constant 1976 dollars) (See section 2.22.)

In comparison with what the builders are presently constructing in the region (see table 2.21b), the recommended distribution of house types has a significantly higher proportion of the housing in town and row houses, and correspondingly lower amount in singles and semis. This reflects the difference in the current demand and the expected demand over the next few years. The current market is largely composed of the existing residents upgrading their houses, and the initial workers at Nanticoke in the relatively well-paid managerial jobs.

In relation to the housing planned in other new communities in Ontario, the overall densities in Townsend will be comparable. Although the Townsend mix generally has a lower percentage of houses in

Table 2.21a
Recommended Range of House Types

Type of Unit	Population Level			
	5,000		20,000	
	%	#	%	#
<u>Private housing</u>				
Single dwellings	30	422	21	1,144
Semi-detached dwellings	9	127	10	541
Street townhouses	20	282	22	1,192
Rowhouse	16	226	24	1,310
	75%	1,057	77%	4,187
<u>Rental housing</u>				
Rowhouses	17	239	6	325
Apartments	8	112	17	908
	25%	351	23%	1,233
TOTAL	100%	1,408	100%	5,420

Table 2.21b
Comparison of House Type Mix

Area	Single and Semi-detached Dwellings	Town and Rowhouses	Apartments
Townsend at 5,000 population	39%	53%	8%
Recent developments in Haldimand-Norfolk	67%	26%	7%
<u>New Communities in Ontario:</u>			
Bramalea	32%	42%	26%
Erin Mills	40%	23%	37%
Malvern	50%	30%	20%
Meadowvale	19%	46%	35%
North Pickering	35%	40%	25%

Table 2.22a
Housing Land Requirements

Density Range	Population Level										
	5,000					20,000				100,000	
	Mix (%)		Dwell-ings (#)		Area	Mix (%)		Dwell-ings (#)		Area	
			ha	a				ha	a	ha	a
low density+	39	408	34½	85	31	1,685	132	326	660	1,630	
medium density+	53	887	20	49½	52	2,827	98	242	490	1,210	
high density+	8	113	1½	3½	17	908	12	30	60	150	
Total/ Average	100	1,408	56	138	100	5,420	242	598	1,210	2,990	

Table 2.22b
Housing Densities

Density Range	Type of Units	Typical Lots	Net Density*	
		ft	dw/ha	dw/a
low	single housing	40-50x110	11	4½
	semi-detached housing	30x110	19½	8
medium	street townhousing	20-25x110	23½	9½
	row housing	20-25x110	34½	14
high	apartments**	-	75	30

* includes land for local roads

** allows for a mix of stacked units at 60 dw/ha (24 dw/a), walk-up apartments at 75 dw/ha (30 dw/a), and elevator apartments at 100 dw/ha (40 dw/a)

the low density range, this is balanced by fewer apartments. It should be noted that the figures for the other communities are for the housing as originally proposed and not necessarily as built: recent evidence indicates that the development pattern is tending toward that shown for Townsend.

2.22 Housing Land

The net residential land required for the recommended range of house types has been determined allowing for typical lot sizes and right-of-way for local roads. (See tables 2.22a and 2.22b.) The net residential land excludes other land residential uses like schools and shops.

At the 5,000 population level, the land required for the 1,408 dwellings would amount to about 56 ha net (138 a). The resulting net housing density would be about 25 dw/ha (10 dw/a), or about 90 per/ha (36 per/a).

At the 20,000 level, the required land for the 5,420 dwellings would be about 242 ha (598 a). The corresponding densities would be about $22\frac{1}{2}$ dw/ha (9 dw/a), or 83 per/ha ($33\frac{1}{2}$ per/a).

Using the same housing mix and standards for a population of 100,000, the plan at ultimate capacity could require approximately 1,100 ha (2,700 a) of housing land.

2.30 Shopping Potential

The shopping provision has been planned to serve the full range of shopping needs in the new community, and to establish the town centre as soon as possible as the main regional shopping area.

The work to date has focussed primarily on determining the overall space requirements and most appropriate commercial structure. In the next phase of the study, a retail marketing strategy will be developed.

The floorspace projections are based upon a number of considerations:

- 1) Townsend will grow approximately as presently projected.
- 2) Townsend will become the largest community in the region.

- 3) The current forms of retailing will not significantly change.
- 4) Townsend will contain the main retail centre for the region.

2.31 Floorspace Requirements

The projections of shopping floorspace have been divided into comparison goods, food, commercial services, and liquor/wine/beer. (See table 2.31a.) Comparison goods have been further split between merchandise sold in department stores and other stores.

The projections take account of the following factors for type of floorspace:

- the income of the Townsend residents
- the relation of income to expenditure over time
- the share of the expenditure that could be captured by stores in Townsend
- the expenditure per unit floorspace.

Comparison Shopping in Department Stores

Department stores are the major draw for a shopping area. Their size and character also will directly influence the potential for other stores or specialty features.

Table 2.31a
Floorspace Requirements (m^2 gross leasable area)

Type of Store	Townsend Population		
	5,000	20,000	100,000
<u>Comparison Goods</u>			
Department Stores	4,650	7,000	55,700
Non-Department Stores	1,850	6,100	49,700
<u>Food</u>			
Supermarkets	1,300	3,150	16,000
Jug Milk	450	1,000	4,650
Other Specialty	250	550	2,400
<u>Commercial Services</u>			
Liquor/Beer/Wine	750	1,100	2,250
TOTAL: m^2	12,800	24,700	150,700
f^2	137,500	267,000	1,615,000

Department stores in Townsend will attract customers from throughout the region, but the bulk of their support population will come from the primary trading area. The primary trade area can be defined as a circle 16 km (10 miles) around the proposed regional centre. (See figure 2.31.) This distance is generally considered to be a convenient driving distance for department store customers. Major department stores generally must be able to break even at least in this area as a prerequisite for development.

The primary trade area for Townsend will also contain the nearby communities of Simcoe, Port Dover, Hagersville, Waterford and Jarvis. This area will contain the bulk of the new population growth in the region. Within this area, the population is expected to grow from a current 35,700 to an anticipated 162,500 by the time Townsend reaches 100,000. (See table 2.31b.)

The projected demand for department stores is approximately 7,000 m² (75,000 ft²) gross leasable area at the 20,000 population level, and 56,000 m² (600,000 ft²) at the 100,000 population level.

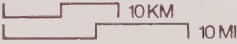
Presently this demand is met by two types of stores: major "full-line" department stores like Simpsons, Eatons and the Bay, and discount or "promotional" department stores like Woolco and K-Mart. Major department stores contain on average about 14,000 m² (150,000 ft²) of gross leasable area, and 9,500 m² (100,000 ft²) for discount stores.

Table 2.31b
Population Forecasts

Area	Year				
	1976	1981	1986	2001	2001+
<u>Population (persons)</u>					
Townsend only	-	7,000	20,000	80,000	100,000
Primary Trade Area	35,700	50,700	63,700	134,700	162,500
Halldimand-Norfolk Region	90,000	109,000	123,000	200,000	250,000



Primary Trade Area



Date Sept. 76

TOWNSEND COMMUNITY DEVELOPMENT PROGRAM



Therefore, Townsend could expect to develop under normal circumstances a discount department store shortly after the 20,000 population level; or alternatively, a full-line department store at about the 30,000 level. At the 100,000 population level, Townsend and its primary trade area could expect to support probably two full-line department stores and two discount stores.

Comparison Shopping Outside Department Stores

Comparison goods typically sold outside department stores include hardware, drugs, general merchandise, apparel accessories, household furnishings and automobile accessories. Outlets for these goods will draw their trade primarily from the Townsend population alone, although expenditure from a wider area also could be realistically expected.

The total floorspace requirements for non-department stores will reach about 6,100 m² (66,000 ft²) at the 20,000 level, and 49,700 m² (535,000 ft²) when Townsend has a 100,000 population. The phasing of this floorspace will depend largely upon the timing of the department stores and supermarkets.

Food Shopping

The food is sold presently in three types of stores:

- 1) Supermarkets located in the regional centre and the secondary or community shopping centres.
- 2) Jug Milk Stores in the neighbourhood shopping centres.
- 3) Specialty Stores spread among the various centres.

Supermarket floor space will take the greatest part of the expected floorspace for food sales. In the supermarkets alone, the expected floorspace increases from 1,300 m² (14,000 ft²) at the 5,000 level, 3,150 m² (34,000 ft²) at the 20,000 level, to 16,000 m² (173,000 ft²) at the ultimate population level.

The smallest full-sized supermarket presently being built is approximately 2,300 m² (25,000 ft²), but this area has been steadily rising. The projected requirements are 3,300 and 3,700 m² (35,000 to 40,000 ft²). Therefore, Townsend might expect to have in the order of six major supermarkets. The first full supermarket can be expected at the 20,000 population level, but with active promotion some part of this store could be built earlier.

The floorspace needed in jug milk stores also will steadily rise from about 450 m² (5,000 ft²) at the 5,000 population level, 1,000 m² (11,000 ft²) at the 20,000 level, to 4,650 m² (50,000 ft²) at the 100,000 size.

The floorspace in these shops generally averages 190-230 m² (2,000-2,500 ft²). Hence, Townsend could expect a jug store to be built at the outset of development, and approximately 16 by the completion of the town.

Other Shopping

Commercial services covers basically two service categories: restaurants, and personal services (laundry and dry cleaning, domestic services, other household services, personal care, and other related activities).

The liquor/beer/wine category includes the projected floorspace for Brewer's Retail and L.C.B.O.

2.32 Retail Structure

The recommended retail structure is a three-level hierarchy of shopping facilities: a regional centre, five-six secondary centres and a number of more local centres. (See table 2.32.)

Table 2.32
Retail Structure

Type of Centre	Anchor	Number at 100,000	Catchment Population	Floorspace (GLA)	
				m ²	ft ²
Regional Centre	2 Full-Line and 1-2 Discount Department Stores	1	100,000+	90,600-97,550	975,000-1,050,000
Secondary Centre	Discount Department Store	1	35,000+	12,100-16,250	130,000-175,000
	Supermarket	5	15,000-20,000	5,550-6,950	60,000-75,000
Local Centre	Jug Store	15-25	4,000-7,000	420-650	4,500-7,000

Regional Centre

The regional centre should be the main commercial area in the new community as well as the region. It will provide a full range of merchandise ranging from comparison shopping to food and commercial services.

The prime tenants at the 100,000 level can be expected to be three-four department stores. Two may be "full-line" stores with about 14,000 m² of gross leasable area (150,000 ft²); one or two may be "discount" stores with about 9,500 m² (100,000 ft²).

With the associated shops and services, including at least one supermarket and a cinema, the total potential floor space in the regional centre amounts to approximately 90,600-97,500 m² (975,000-1,050,000 ft²).

Adding in land needed for other services, landscaping and parking, the entire site for the commercial area could be between 20 and 30 ha (75 and 100 a). The land requirement is largely dependent on the proportion of surface and stacked car parking.

Secondary Centres

Stores in the secondary centres will provide for the weekly needs of the surrounding population of approximately 15,000 to 20,000 people for convenience goods and personal services. The largest store, or anchor, in the secondary centres will be a supermarket.

Approximately six large supermarkets could be supported by the community at 100,000 population. Of these, four-five would be located in secondary centres. The strategic plan has been prepared on the basis of five being in secondary centres.

The floorspace in supermarkets in each of these centres could be 3,300-3,700 m² (35,000-40,000 ft²). Adding the floorspace needed in the associated shops, the total commercial space in a typical secondary centre could be 5,500-7,000 m² (60,000-75,000 ft²). With the other required space and car parking, the site area could be 2½-3½ ha approximately (6-8 a).

An additional secondary centre — referred to as a district centre — also might be developed in the long-term. This would be anchored by a discount department store, and perhaps contain other automobile oriented outlets like automobile dealers, building supplies and furniture stores.

This centre could contain in the order of 12,000-16,250 m² (130,000-175,000 ft²), and take a site of 6-8 ha (15-20 a).

Local Centres

The basic component of neighbourhood shopping is the "jug store". This has replaced what is often referred to as the corner store. It has the smallest trade area, and is used by residents within reasonable walking distance for staple goods, sundries and other convenience goods. This kind of shop continues to thrive largely because of its extended hours of business and close proximity to the local population.

One of these centres has been proposed generally for each 4,000-7,000 residents. In most cases, jug stores will be located in local centres with one or more other shops, all serving basically a local function. The total floorspace in a typical local centre might be 400-650 m² (4,500-7,000 ft²). The area required for each of these centres with parking is about 0.1 ha (0.25 a).

Other Centres

In addition to conventional shopping within this three-level shopping hierarchy, a wide range of other goods and services also will be required. This will include facilities like service stations, drive-in restaurants, building supplies and many other diverse establishments that generally fall in the category of "highway commercial". To accommodate these facilities, other sites will be required primarily along arterial roads.

2.33 Retail Phasing

As part of the marketing strategy to be developed in the next phase of this study, the phasing of the retail facilities will be examined within these objectives:

- The regional centre should be established as soon as possible as the main shopping centre for the town.
- The secondary centres should be developed only after the regional centre contains a department store. Thereafter, these centres should be built on a regular basis as the town continues development.
- The local convenience centres should be developed in step with the population growth. No housing area should be without local convenience shopping from first occupancy or shortly thereafter.

- In the long term near ultimate development, a district-type secondary centre might be anchored by a discount department store.

2.40 School Requirements

The expected public and separate school systems in Townsend are outlined in this section, together with the required school sizes and distribution.

These requirements generally reflect the views of the three local school boards of education (Norfolk, Haldimand and Haldimand-Norfolk Separate), as well as the Ministry of Education and the Ontario Institute for Studies in Education (OISE). However, further discussions will be needed over the next phase of work to resolve a number of detailed matters, especially concerning the initial development program.

2.41 School Enrolment

Attendance in both the public and separate school systems are expected to parallel other industrial centres of southwestern Ontario. Overall, nearly all of Townsend's 5-13 year old population can be expected to enrol, and 85% of the 14-18 year olds. Within this enrolment, the demand for Roman Catholic separate schools will probably account for about 30% of elementary school enrolment.

The region presently does not have a separate high school, nor is one likely in Townsend. If the demand warrants the expansion, the school board may add the 9 and 10 grades to the 7 and 8 levels, creating a two-tier system with K-6 elementary and 7-10 intermediate schools. Therefore, all Roman Catholic high school students will attend public high schools, or 20% of the grade 9 and 10 high school students will attend a Roman Catholic 7-10 intermediate school.

2.42 School Structure

The recommended school system is tri-level, with a junior elementary, senior elementary/intermediate, and secondary schools. This follows current practice in the urban centres of Haldimand-Norfolk and throughout Ontario, and is consistent with the views of the local school boards. A tri-level system of education groups young children, young adolescents and older teenagers in separate schools; such

groupings improve the educational atmosphere at each level and provide better opportunities for specialized facilities.

Haldimand-Norfolk's three boards of education agree on the tri-level system for Townsend, but each suggests different grade groupings at the senior elementary or intermediate level. The recommended school system for Townsend has a 7 and 8 senior elementary school in the public system. This arrangement compliments the existing systems, and corresponds to the Ontario teacher classification.

The low demand in the early stages of development will require adjustments to this system. Until enrolment reaches a sufficient level at approximately 20,000 population, the K-8 schools for both public and separate systems will be necessary.

2.43 School Capacities

The existing schools in the region are relatively small and scattered. This reflects both the predominantly rural population and the school boards preference for the educational atmosphere of smaller schools.

Capital and operating costs per pupil can be significantly lower for larger schools than smaller ones. Larger schools also can provide corresponding savings in land requirements. Furthermore, they can support larger or more specialized facilities that can be shared or complemented by community-wide associations.

Taking into account these diverse views, the recommended range of school sizes have these capacities:

- Elementary schools 500 to 600 pupils
- Secondary intermediate 1,000 to 1,300 pupils
schools

The smaller school sizes correspond to the upper limit of the boards current capacities and to the minimum sizes suggested by OISE planners. The larger school sizes represent the maximum that the boards would consider at present, especially for junior elementary schools.

2.44 School Sites

The size of school sites can be reduced up to 25% through shared land use by combining school sites into campuses, with parks or with other community facilities. (See table 2.44.)

The parkland use must complement the adjoining type of school. For example, junior elementary schools are best associated with local parks with playgrounds. Senior elementary and high schools can share larger park facilities in community parks, such as tennis courts, playing fields, swimming pools, track facilities. (See sections 2.50 and 5.50.)

Other school and community facilities can be more fully utilized if shared. Facilities most suitable for use by students and the community are auditoria, vocational training workshops, gyms, arenas, libraries and health services. These sharing options are most appropriate with secondary schools, where parking space and good access from major roads are available.

2.45 Phased Requirement

Townsend's school needs will vary over time, reflecting the initial dominance of young family households. Townsend's first 5,000 persons are expected to have about 22% aged 5-13 years, while this group will constitute only 15% of the total population at the 80,000 population level. The 14-18 age group is more constant, varying between 9-10% and peaking at the 20,000 level.

Table 2.44
School Sites (ha)

Type of School	Single School	Single School with Park	School Campus
Junior Elementary (K-6)	2.4-3.2	2.0-2.4	2.0
Senior Elementary (7 & 8)	3.2-4.0	2.8-3.6	2.4-3.2
Intermediate (7-10)	6.4-8.0	4.8-6.4	4.4-6.0
Secondary+ (9-13)	6.4-8.0	4.8-6.4	4.4-6.0

Table 2.45
School Requirements

Type of School	5,000 Population		20,000 Population		100,000 Population	
	Min ¹	Max ²	Min ¹	Max ²		
<u>Public</u>						
K-6	-	1 (500)	4 (2,170)	4 (2,000)	<div>or 5 (2,170)</div>	13 (7,875)
K-8	1* (770)	1 (270)	-	1 (500)	-	-
7 & 8	-	-	1* (630)	1 (300)	<div>2 (630)</div>	4 (2,450)
9-13	** (335)	** (335)	1* (1,650)	2 (1,650)		5 (6,830)
<u>Separate</u>						
K-6	-	-	-	2 (930)	<div>5 (3,375)</div>	<div>or 5 (3,245)</div>
K-8	1 (330)	1 (330)	2 (1,200)	-		<div>1 (600)</div>
7-10	-	-	-	1 (270)	<div>1 (1,770)</div>	<div>1 (1,300)</div>

* portable classrooms

** busing

1 600 pupil elementary schools and 1,300 pupil intermediate or secondary schools

2 500 pupil elementary schools and 1,000 pupil intermediate and secondary schools

() number of pupils

As a consequence, the average support population for junior elementary school at the 5,000 and 20,000 population size is 5,000 people, but at the 100,000 level it is about 8,000. The actual catchments for each school should be constrained as little as possible by physical planning, in order to allow nearby schools to balance enrolment as the town grows. The school requirements projected for the early stages are based upon two options (see table 2.45):

- 1) The first, which describes the maximum number of buildings that could be necessary, uses the smaller school sizes and assumes that building will occur in anticipation of need so that no portable classrooms are necessary.
- 2) The second, which describes the minimum number of buildings possibly necessary, uses the larger school sizes and assumes that no school building would occur until warranted by pent-up demand. This option therefore would require some schools to operate over capacity, and portable classrooms would be required to house the overflow.

At 5,000 population, the Townsend school could include the following:

- 600 pupil K-8 public school with portables accommodating 770 pupils; or a 500 pupil K-6 and a 500 pupil K-8 school, both used at under-capacity
- one 500 or 600 pupil separate elementary school for a projected enrolment of 330 pupils.

No school would be provided for approximately 335 public secondary school students; these would be bused either to Waterford or Hagersville, depending on the jurisdiction in which the housing is located.

By the 20,000 level, Townsend could contain the full range of schools:

- 4-5 public elementary K-6 or K-8 schools
- 1 public intermediate 7 and 8 school
- 1-2 public secondary 9-13 schools
- 2 separate elementary K-6 or K-8 schools
- 1 separate intermediate 7-10 school

2.50 Open Space and Recreation Facilities

The overall standard that has been used in the planning of Townsend is 2 ha/1,000 population (5 a/1,000) solely for local open space requirements to be contained within the developable land mainly in the residential areas. (See Table 2.50a.)

A further 2 ha/1,000 also should be allowed for the larger and town-wide facilities like general parkland and golf courses. However, this standard is of less concern because the natural and undevelopable areas of the site in the valleys and woodlots will be more than adequate to accommodate most of these needs.

Standards should be treated only as interim guidelines used for planning. Before a set of

Table 2.50a
Open Space Standards for the Residential Areas in Townsend

Area	Population Catchment	Walking Distance (m)	Area (ha/1,000 population)
Local Area	500-1,000	100-250	0.4
Neighbourhood Area	4,000-7,500	400-750	0.6
Community Area	15,000-20,000	1,000-1,500	0.6
Pedestrian System and General Landscaping	-	-	0.4
TOTAL	-	-	2.0

Table 2.50b
Recommended Standards for Developed Open Space**

Area	Provision (ha/1,000 population)	Service Radius	Minimum Size
sub-neighbourhood areas		100 m minimum	50 m ²
neighbourhood park with elementary school*	1.6	400-800 m	4 ha
community park with secondary school*	1.2	1600-2400 m	12 ha
urban, regional and special use areas (including public golf courses and conservation area)	5.2	8-32 km	20 ha
Total	8ha/1,000		

* It is assumed that the park and the school are adjacent and completely accessible to each other. If they are not, then the acreage for the park and for the school should each be increased by 25 per cent. These figures include the space occupied by the buildings on each site and the parking areas.

**Ministry of Culture and Recreation:
"Guidelines for Developing Public Recreation and
Facility Standards," 1976.

standards can be recommended for Townsend, they must be more carefully related to local needs and financial capabilities.

Current planning legislation in Ontario requires that 5% of any subdivision area be dedicated for usable open space for local needs. In typical suburban subdivisions, this generally amounts to approximately 1 ha/1,000 population ($2\frac{1}{2}$ a/1,000).

The overall standard used in planning Townsend, however, is consistent with the public open space planned in the recent new communities in Ontario. These have generally incorporated in the order of 2-2½ ha/1,000 population (5-6 a/1,000), exclusive of major natural areas like valleylands.

The standard is also comparable to the recent recommendation of the Ministry of Culture and Recreation. Based upon a consensus of opinions expressed by recreationalists in the province, they recommend that an 8 ha (20 a) of "developed parkland" as a minimum should be provided for every 1,000 people. Of this, about 2.8 ha/1,000 should be contained in the residential area. (See table 2.50b.)

Finally, these standards have been used because they can accommodate what appears to be a reasonable range of park facilities. (See section 5.60.)

2.60 Special Facilities

The need for two special facilities in Townsend have been identified to date.

2.61 Community College

Virtually no post-secondary facilities exist in the area at the present time. Students must leave the region in order to obtain training. The growing population of the region will further increase the need for more post-secondary opportunities in the region. In addition, the industrialization of the area will create a heavy demand for special training programs.

Three college areas cover parts of the new region of Halldimand-Norfolk. The Mohawk College area, centered in Hamilton, includes the northeastern part of the region; Fanshawe the western part; and Niagara the southeastern. These college area boundaries are presently being redefined in order to provide for the most effective post-secondary

education planning for the new population expected to come to the region.

The anticipated school enrolment at the campus is 475 in 1981, 1,260 in 1986 and 1,800 in 1990. The projections can be compared to the current Haldimand-Norfolk post-secondary population, which amounts to approximately 550 students attending colleges and a further 750 attending universities.

The first phase of construction would include some 18,600 m² (200,000 ft²) of floorspace, which is sufficient for five years growth. Expansion would be undertaken where the student numbers warrant it.

Planning for such a post-secondary institution (probably to be called Townsend College) is underway in conjunction with the relevant college and Ministry of Colleges and Universities staff. In order to accommodate both early and future growth a site of at least 10 ha (25 a) near the regional centre is under consideration.

Completion of the first stage of the college is anticipated for late 1981. In view of an anticipated demand for education programs, interim facilities may be required.

2.62 Regional Administrative Centre

The Regional Municipality presently has about 110 employees in office and general administration. They are accommodated in two buildings in Cayuga and Simcoe. The regional administrative staff is expected to reach a total of about 400 employees by 2001.

The Regional Council has decided to build a new administrative centre in Townsend to consolidate their offices and allow for future expansion needs.

To accommodate the projected staff, the total floor-space required is about 21,500 m² (70,000 ft²) gross. As presently proposed this area would be developed in a new centre in these three phases:

Phase 1 - 9,200 m² for basic offices and Council Chamber

Phase 2 - 6,500 m² for additional offices.

Phase 3 - 6,500 m² for health and social services, and other offices.

The projected floorspace excludes any provision for police. Neither does it allow for public school boards, court houses and registry offices; each of these is likely to remain for the present in their existing accommodation in both Simcoe and Cayuga, as their jurisdictions remain divided into the two former county areas.

As a first estimate for the car parking required, the administrative centre when fully developed could need a site of 2-2½ ha (5-6 a) in total.

A suitable site has been reserved at a prominent location readily accessible from highway 3 & on the edge of Townsend's future commercial core. (See section 4.20.)

In the future sites may also be required for a number of other regional functions:

- 1) Public works depot
- 2) Police headquarters
- 3) Recreation centre
- 4) Cultural facilities (library, theatre, and others)
- 5) Registry office
- 6) Courthouse

BACKGROUND

3:00 SITE CONDITIONS

A broad appraisal of the character and resources of the entire Townsend site was made in the previous phase of this study. As reviewed in this section, a more detailed investigation now also has been completed of the various features affecting development within the initial and mid-term development areas.

3.10 Abiotic Features

3.11 Flood and Fill Lines

The susceptibility of the creek valleys to flooding is the major abiotic constraint of the site.

Mapping of the flood and fill lines for the watercourses in the site has been prepared by consultants for the Long Point Conservation Authority (LPCA). The flood line is based upon the worst condition derived from two design criteria: either the regional storm as defined by "Hurricane Hazel" or the tropical storm with a return frequency of one in 100 years.

In Townsend, the fill line was defined by incorporating slopes greater than 3:1, natural vegetation adjacent to the flood line important for erosion control, and wetlands and marshlands. The flood and fill lines are never coincident; where no other factor can be applied, a set back of 15 m (50 ft) is used from the flood line to establish the fill line.

Generally, the construction of any permanent building or structure within the floodline will be prohibited by the conservation authority. The fill lines are considered more permissive, but the authority has the power to prohibit or regulate any construction or placing of fill that will affect flooding, pollution, soil erosion, human safety, and land conservation.

Until the lines are formally registered, the location of the fill line through the site is still somewhat flexible and open to discussion. The lines will not be registered until the government determines which storm criteria to use. A study is now underway, and probably will not be completed until the end of this year. If the flood line changes, the fill line will change only where the arbitrary setback has been used to avoid coincidence.

Any flexibility in the flood line relates solely to the removal of restrictions caused by existing culverts and, thereby, lowering the flood line. However, this is not likely to provide any increase in the land area available for development.

Because the fill line for the entire site has been defined conservatively, on the basis of map and aerial mosaic interpretation, a field appraisal of the line within the first development area (excluding the quarry site) has been completed to check the actual terrain conditions as preparation for the detailed planning of the area in the next phase. Only relatively slight modifications to the lines prepared for the LPCA can be suggested. (See figure 3.11.)










3.12 Existing Quarry

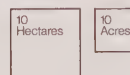
The quarry next to the Nanticoke is being excavated for low-grade aggregate for roadbeds. The operation presently takes about 3 ha, but permission has been granted for working an area of 20 ha. The present lease terminates in 1977. Certain minimal remedial landscape treatment will be required.

The quarry, although now unattractive, has the potential for being reclaimed and used for limited recreational purposes. A first examination of the potential suggests that the area could be used for two ponds set within the Nanticoke valley. (See figure 3.12.) The larger of these two could be used for recreation; the second could be used for storm retention. To combine these two uses within one pond is considered incompatible because of pollution in the run-off.



Detailed Constraints Medium-Term Development Area

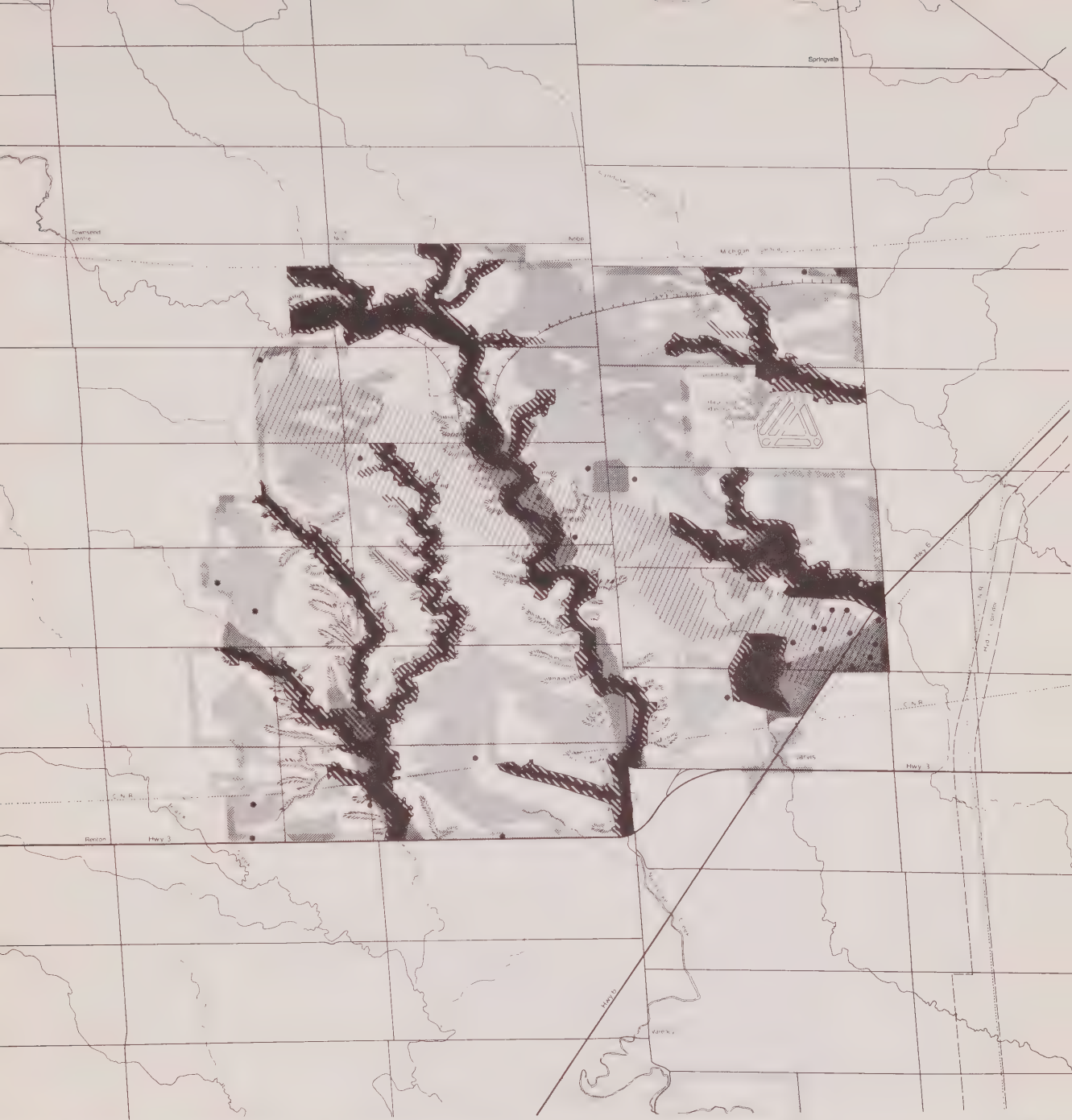
- | | |
|--|---|
|  Stream Courses |  Quarry Area |
|  Flood Plain |  Significant Buildings or Group of Buildings |
|  Fill Line |  Other Buildings |
|  Woodlots |  Former Saw Mill Site |
|  Hedgerows |  Archaeological Site |
| |  Cemetary |



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Abiotic Constraints for Development

- Flood Plain (Incomplete Data)
- Zone of Possible Bedrock Sinks
- Gypsum Bearing Formation <30m. from Surface
- Fill Line (Incomplete Data)
- Gas Wells
- Shallow Overburden (Less than 5m. to Bedrock)
- Poorly Drained Soils (20% to 50% of Area)
- Poorly Drained Soils (>50% of Area)
- Steep Slopes (More than 9%)
- Other Areas Liable to Seasonal Flooding

Source : Dillon, MNR, ESP and Dr. Chesworth



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Flood Plain and Fill Line Initial Development Area

- Flood Plain *
- Fill Line *
- Suggested Fill Line

4 Hectares

4 Acres

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Source: * Long Point Conservation Area Authority



Potential Ponds at the Existing Quarry

-  Area Licensed for Quarrying
-  Flood Plain
-  Steep Slopes

150M.
500 FT.

Date Sept. 76
Scale 1:5000



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Ministry
of Housing
Ontario

The recreation pond is limited to about 80 acre-feet, based upon the quantity of water that could be taken from the Nanticoke and the retention time within the pond. To maintain water quality and sustain warm water fish, a maximum depth of 3-4.5 m (10-15 ft) will be needed. Hence, the surface area of the pond could be approximately 4 ha (10 acres). Water quality will allow fishing, but not swimming.

The second pond would cover approximately 1½-2 ha (3-5 a) to a depth of 3-4 m (10-12 ft) minimum. Its size would be determined largely by the runoff requirements. It should be also fed from the larger pond to improve the quality of water. In addition to storm water retention, this pond also can be used as a sediment trap basin during the construction, and a wildlife area particularly for ducks and geese.

The recreation activities possible in the area include skating on the pond, and tobogganing and sledding if the appropriate grades and setbacks can be developed.

3.13 Subsurface Conditions

An initial subsurface investigation of the entire development area has been completed. (See figure 3.13.) A second and more detailed investigation will be undertaken in the first development area to aid in the subdivision planning.

No major geotechnical constraint to the proposed development has been identified. The site appears suitable for using conventional construction techniques for the buildings, roads and underground services. The subsurface conditions also are well suited for conventional spread footings used in light residential buildings. Heavier and/or settlement sensitive structures that cannot economically be supported on shallow foundations can be supported on piles or caissons founded within the bedrock.

Any potentially unstable slopes are confined to areas already defined as undevelopable because they are within the flood and fill lines.

The groundwater level in the overburden ranges typically between 0.5 and 1.5 m below ground surface. The groundwater level in the bedrock is probably largely influenced by recharge from exposures in the creek beds, and therefore, should approximately reflect the creek water levels.

South of the Townsend site small caverns are found in the bedrock exposures along small creeks. Some caverns, typically 1.2 m (4 ft) in size, apparently have been inferred to reflect the possible existence of "sinkholes" in the bedrock, caused by the collapse of solution caverns. (See figure 3.10.)

Because solution caverns were identified as a development hazard on the site, special attention was given to finding any evidence that might confirm their existence. Two fairly large depressions are indicated in the bedrock surface by the borehole survey. Because neither can be seen on the surface, this suggests they are not caused by solution caverns. Two boreholes were drilled within the area of these depressions. An inspection of the rocks exposed along the quarry face revealed that some weathering and minor dissolving of the limestone is evidenced along some of the major joints and bedding planes, but the solution was not of the extent or form to suggest that large cavities would be formed in these strata.

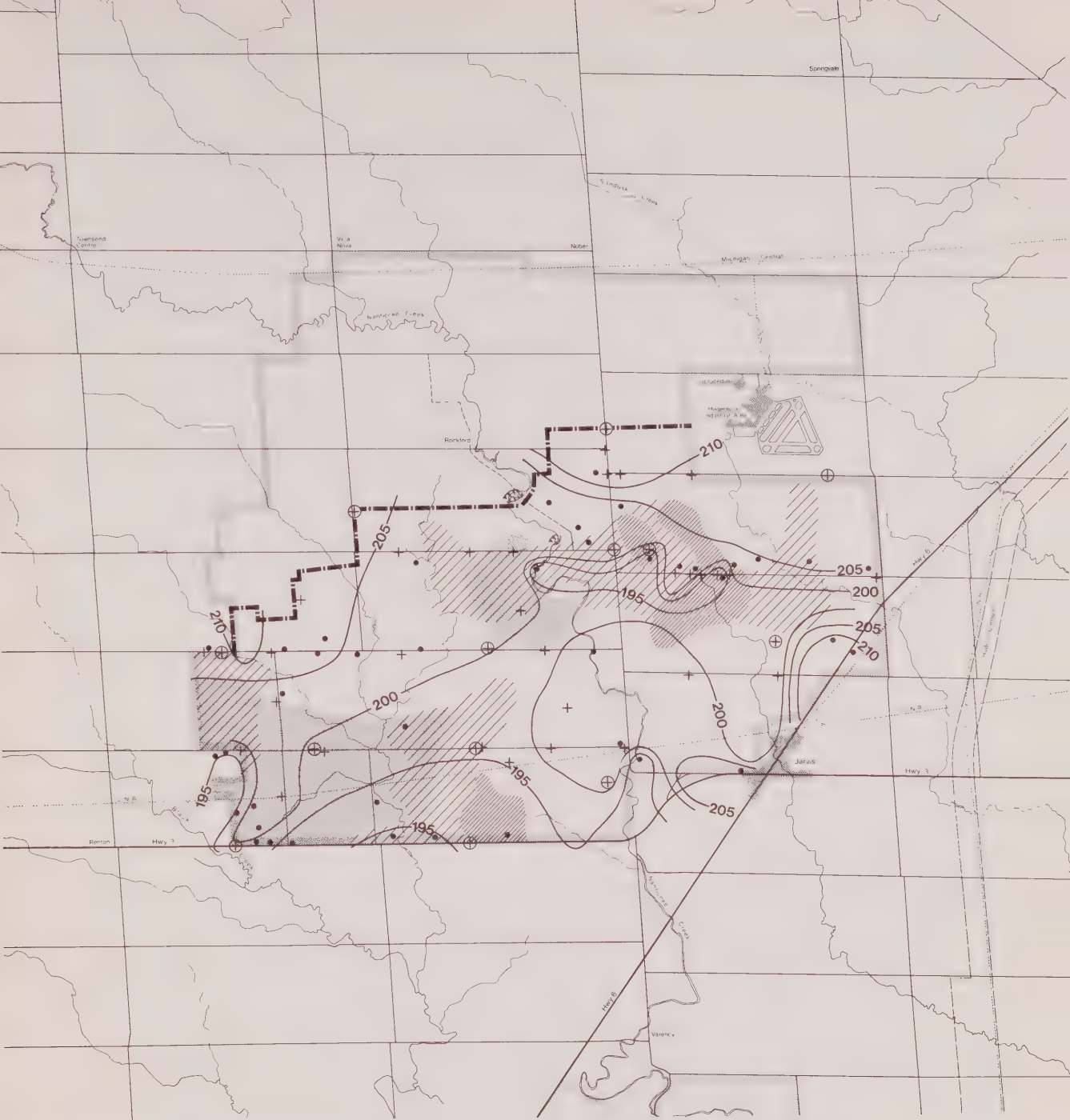
On the basis of all the available evidence, any solution caverns that might be in the bedrock are considered unlikely to be of sufficient size to affect the safety of conventional low rise building construction within the site. However, before the final design of structures to be founded on bedrock, a suitable investigation of bedrock conditions should be carried out at the particular construction site.

3.20 Biotic Features

3.21 Woodlots

All woodlots, hedgerows and tree groupings in the 20,000 population area and the associated creek valleys were evaluated for their quality and sensitivity to urban development. (See figures 3.21a and 3.21b.)

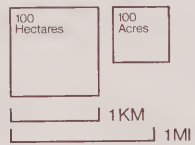
Woodlots with a high sensitivity to urban development are recommended for passive recreation use as part of the open space system. Approximately 90% of the woodlots in the study area would be included in this designation; these woodlots to a large extent also are within the stream valleys.



Subsurface Conditions

- Bedrock Surface Contour (approx.) (m)
- Rock Exposure
- Significant Sand Deposits
- Wet Zones
- Very Wet Zones
- Existing Gas or Water Well
- Borehole Location
- Seismic Test Location

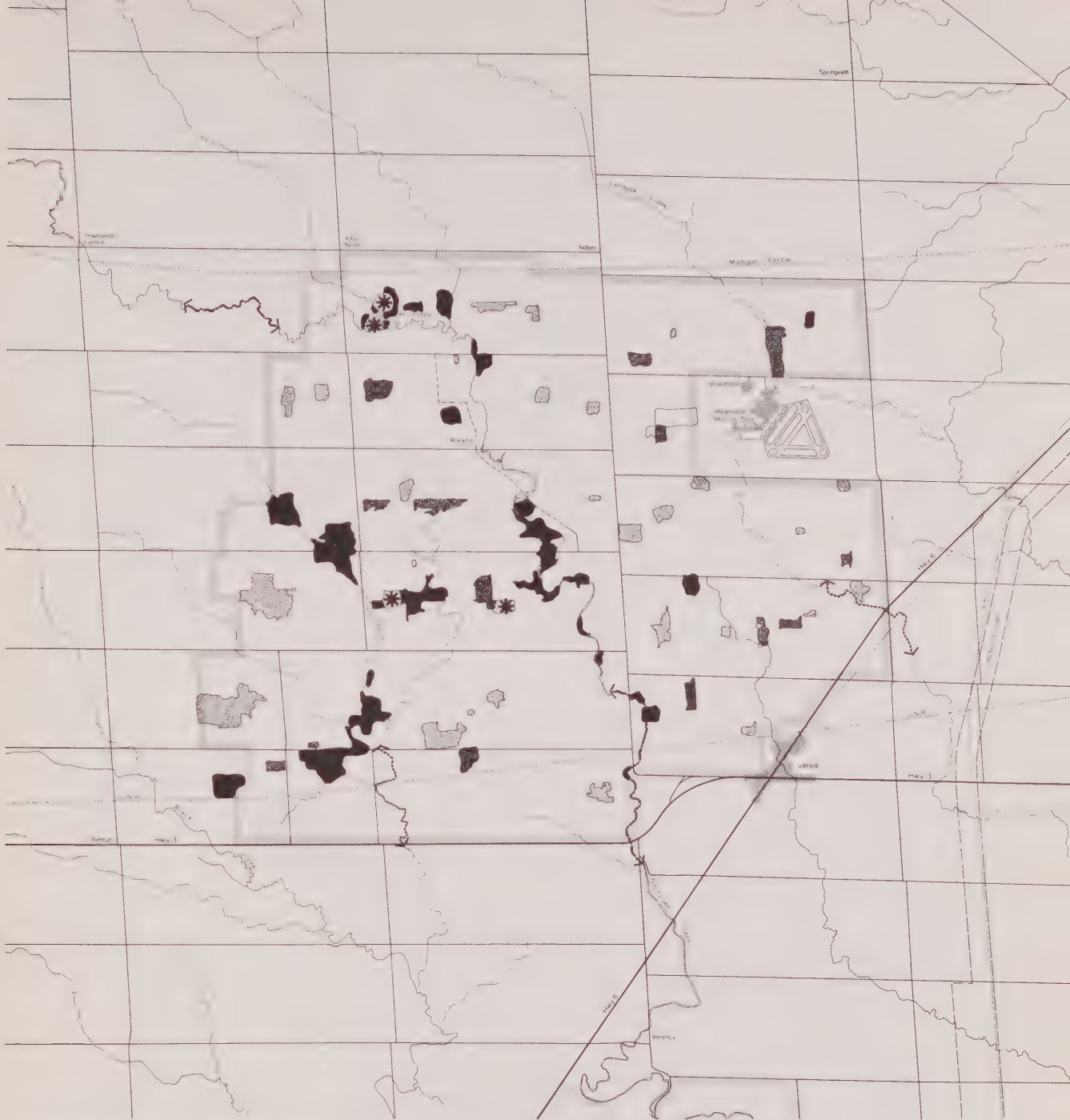
Source : **Golder Associates**



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Biotic Constraints to Development

- Woodlots: Low Acceptability for Urbanization
- Medium Acceptability for Urbanization
- High Acceptability for Urbanization

- Water Quality: Medium
- Medium to Low
- Low

* Suggested International Biological Program Sites

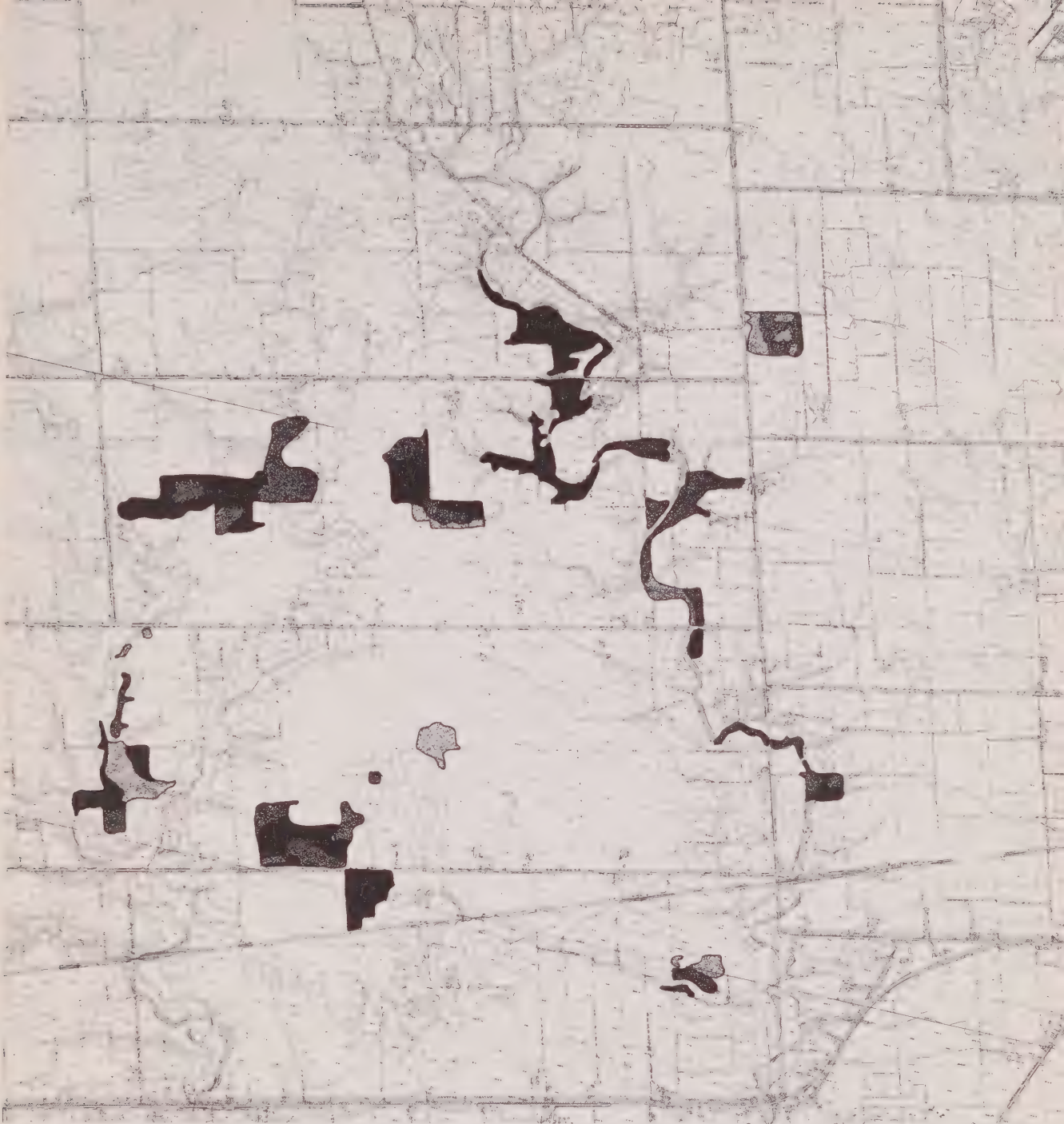
Source: MoE and Ecoplans



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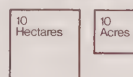
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Bio-aesthetic Quality of Woodlots

-  High
-  Medium
-  Low



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Urban Sensitivity to Woodlots

- High
- Medium
- Low



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Cultural and Historical Constraints

- * Known Archaeological Sites
- Study Area for Other Possible Sites
- Major Grouping of Historic/Architectural Buildings
- Other Grouping of Historic/Architectural Buildings
- Former Saw Mill Sites
- Significant Historic/Architectural Buildings
- Important Historic/Architectural Buildings
- Former Mill Pond
- Cemetery



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Source: T.C.P.T., U. Women's Club of Norfolk, Big Creek C.A., Dr. P. Ramsden & Historic Atlas of H.N.C.



Woodlots with a medium sensitivity for urban development could be used for low density residential development or intensive recreation use. However, careful planning and site control will be needed to protect vegetation and soil. High quality trees should be preserved and integrated into the development to provide natural amenity for the site. Approximately 8% of the woodlot study area would be included in this designation.

Remaining woodlots could be used for multiple family housing, intensive recreation use, or institutional use. Site controls for the protection of individual high quality trees will be needed.

Hedgerows and planted tree groupings should be carefully integrated into the urban fabric. If left undisturbed, these small tree groups usually have a high tolerance for urban conditions during the construction.

3.30 Cultural and Historic Features

3.31 Archaeology

A field survey was undertaken in the first development area. No potential archaeological sites of significance were identified. Archaeological materials were recovered in five spots, indicating that the area was used by transient prehistoric groups, probably from the Archaic and Iroquoian period. Nevertheless, on the basis of this evidence, little of archaeological importance will be disturbed by construction of this particular area.

A possible site of major significance, however, was located in the Black Creek watershed. (See figure 3.30.) As indicated by an apparent abundance of pottery materials, this could be a fairly large site from the middle Iroquoian period. This area requires additional study to determine its extent and importance. It is outside the initial development area, but may effect the potential alignment of roads in this area.

3.32 Anderson's Cemetery

A small cemetery of about 75 m² is situated on a knoll overlooking the Nanticoke valley directly west of Townline Road. This burial ground dates back to the mid-1800's. Only 9 tombstones are visible — all in poor and fragmented condition — but apparently more people are buried there. The actual legal status of this cemetery is not known.

3.33 Existing Buildings

To supplement the historic survey of the existing buildings and structures throughout the site already made, a visual survey was undertaken of the buildings within the mid-term development area to identify structures that should be retained.

Two attractive groups of buildings are located near the Black Creek. Each contains two or more substantial farm residences which, together with the cluster of mature trees, should be integrated into the town if at all possible.

RECOMMENDATIONS

4.00 FIRST STAGE

A number of decisions have been made to allow the first development to proceed. These decisions concern the locations of the first housing area, the town centre, the regional administrative centre, Townline Road, and initial engineering services. (See Figure 4.00.)

4.10 Housing Area

The development area will contain both the first housing area for roughly 5,000 persons and the town centre. This area has been located west of the Nanticoke about 1 km north of Highway 3.

This first development area contains in total about 200 ha (500 a). Ultimately, the town centre may require 80-110 ha (195-270 a). (See Section 5.20.) Housing for 5,000 people, together with the associated schools and other facilities, would need about 75 ha (185 a). Therefore, the area should be sufficient to accommodate both needs.

The town centre is to serve the region as well as the new community. In addition to the new regional administrative centre, a number of early facilities need sites. Therefore, it is important to identify the regional centre and to make sites available for development as soon as possible.

The placing of the early housing and any early regional facilities close to each other is seen as an important means of fostering Townsend's development.

The early regional facilities will make the initial community more attractive and diverse — bringing to it a degree of shopping, employment and other opportunities not normally associated with towns of its size. The local facilities needed for the early residents can assist in establishing the regional centre as a focus of commercial and social activity.

The selection of the area for both was focussed in the Nanticoke watershed in the southern part of the site near Highway 3, because this area satisfied two important conditions:

- 1) to develop an attractive part of the site in order to assist in the marketing of the housing as well as the centre;
- 2) to locate the initial development near regional roads and services in order to minimize front-end costs.

To arrive at the recommended location, an evaluation was made of three alternatives:

- the housing and centre both west of the Nanticoke
- the housing east and the centre west
- the centre east and housing west.

(See Figure 4.10.)

The decisive factors in the final selection were the costs of early services and accessibility to the centre.

The cost of early engineering services represents a major front-end cost that should be kept to a minimum. This can be best achieved by locating all early development on one side of the Nanticoke.

The viability of the regional centre in large measure will depend upon its accessibility to the region. In the early years, access by Townline Road from Highway 3 will be better to the western side of the valley. In the later years, additional regional access will need to be provided in the east-west direction. This supplementary link can be more readily provided in the western option.







4.20 Regional Administrative Centre

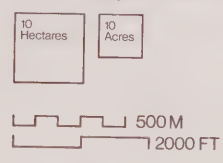
A site for the regional administrative centre has been selected so that the building can be designed and constructed by the region's projected occupancy date of mid-1978.

The development of the regional administrative centre, as well as other major facilities, is considered as an important step toward establishing the new regional centre.



First Stage

-  First Housing Area
-  Regional Centre
-  Regional Administrative Centre
-  Linear Park along Nanticoke Valley
-  Townline Rd. (Indicative Alignment)
-  Temporary Sewage Stabilization Pond



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First Housing Area & Regional Centre Alternative Locations



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Description of Site

The site rests in the bend of the Nanticoke Creek. It is defined by the existing Townline Road on the west, the first field line south of the creek, and the floodline of the valley to the north and east. It covers in total about 1.7 ha (4.2 a), of which 0.4 ha (1.0 a) is in the fill line.

This attractive and prominent site offers a number of important features:

- the site is next to the Nanticoke valley, which will be used as the town park system
- convenient access is provided by existing roads from Highway 3 to the south and Highway 6 to the east
- it is well-located in relation to the future town centre uses.

The site is at the northern end of a larger area between the Nanticoke Creek and the new Townline Road that has been designated in the plan for institutional and office uses. The full extent of this area cannot be precisely determined until the new alignment of Townline Road is fixed. However, it will be able to accommodate the additional area up to 8 ha (20 a) needed by the region, as well as other uses.

The uses for this relatively prestigious and prominent area include additional space for the regional administrative centre, the police headquarters, a registry office and a courthouse. Other public office uses — including local, provincial and federal — may be prime candidates. The community college and hospital might also be located in the area, and private offices could be accommodated depending on the early demand.

Some of the other regional facilities, however, will be probably better located elsewhere. Housing for the elderly should be located near local facilities and probably in a more residential setting. Any recreation facilities and cultural buildings, like a theatre or library, probably should be developed within the commercial core, where car parking and public transit facilities will be better. The public works depot, which is not an attractive use, should be located in the industrial area along Highway 3.

4.30 Townline Road

Townline Road has been identified as the main access road into the early development area of Townsend.

This north-south road will connect to Highway 3, bisect the Townsend site and link to the Stelco industrial area to the south.

Existing access to the site from Highway 3 is limited to two roads. One is near the western edge of the site, and the other from Jarvis is circuitous and constricted to one lane at the railway underpass. Therefore, a new entry road is important to market the housing, give access to early regional centre facilities, serve work trips to Nanticoke, as well as accommodate construction traffic.

Although the right-of-way exists, Townline Road has never been built in the short length between Highway 3 and the CN railway because of the construction difficulties imposed by the meandering Nanticoke Creek.

A number of alternative alignments for Townline Road, including one along the present right-of-way, were examined between Townsend and the Stelco Industrial Park. (See Figure 4.30.) These were evaluated using various engineering, environmental and planning considerations.

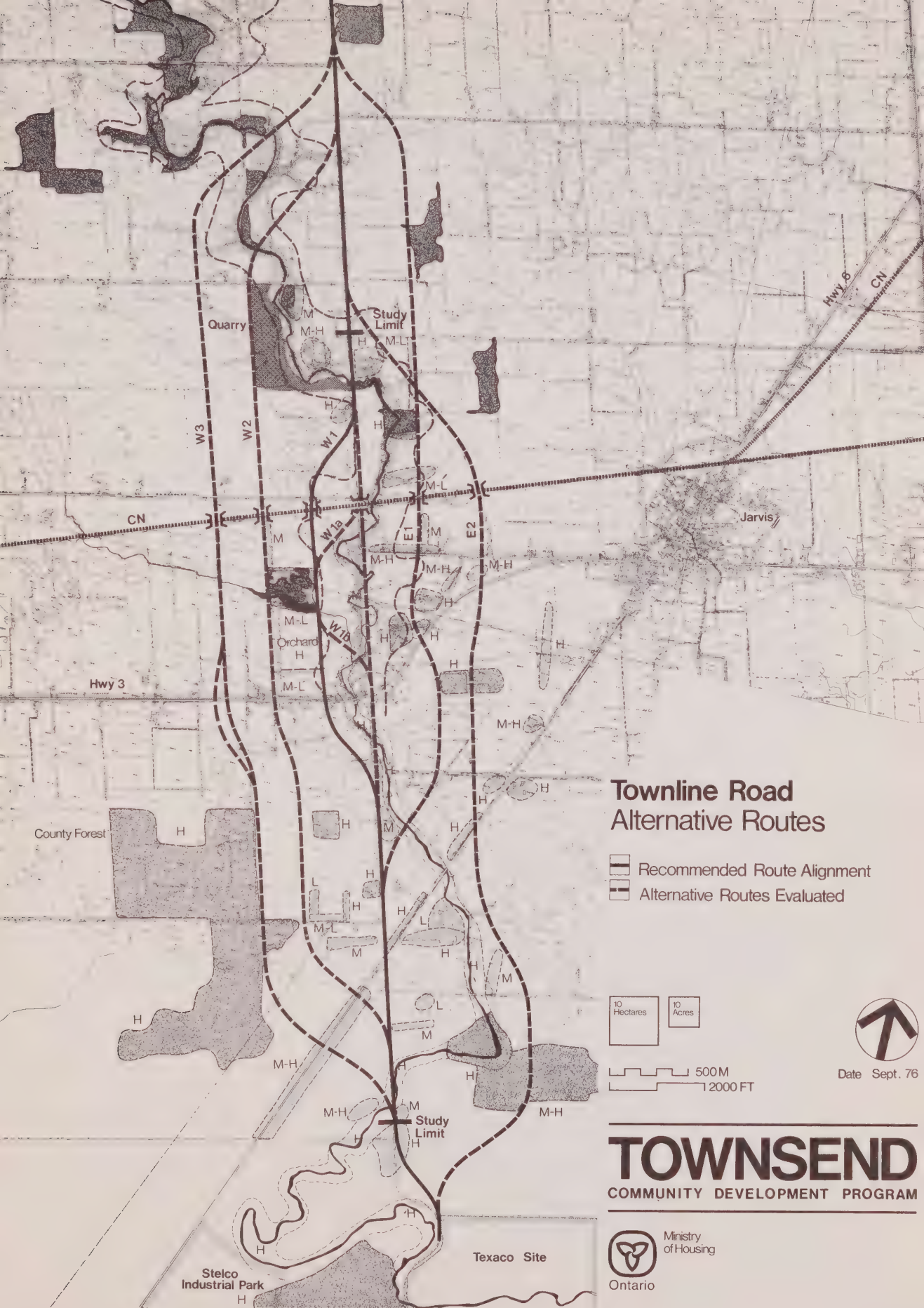
The proposed road is expected to be a four-lane rural road (50 mph and 4% maximum grade), with a 45 m (150 ft) right-of-way that would allow for an additional two lanes if needed.

The preferred alignment, W1, has the least diversion from the existing right-of-way. It would bypass the Nanticoke to the west, and have a new overpass over the CN railway.

The alignment is indicative only. For the purposes of detailed design and evaluation, W1 represents an alignment located within a corridor approximately 300 m wide between the valley and the next property line west. Within this corridor, there is considerable flexibility to create an attractive entry to the new community. In the detailed design, attempts should be made to avoid the fill line, minimize damage to the orchard and pond in the area, and protect the valley from noise and salt spray.

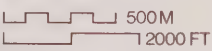
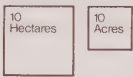
Alignment W1 was considered the best option from a variety of viewpoints:

- it would cause less environmental damage than the others, and less property severance excepting a route on the existing right-of-way
- it would provide good access to the early development, while not constraining the future flexibility of the regional centre
- construction costs would be only 10-15% more than the least cost option, E1.



Townline Road Alternative Routes

- Recommended Route Alignment
- Alternative Routes Evaluated



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4.40 Engineering Services

The initial regional services and utilities serving Townsend are being planned by various other agencies. A summary of the current status of these associated works is presented to complete the early planning context for the community.(see figure 4.40)

4.41 Temporary Sewage Lagoons

Because the new regional sanitary drainage system will not be available in Townsend until 1981, interim sewage stabilization ponds will be required on the site.

Five general areas were first evaluated (see figure 4.41) using a variety of environmental, planning and engineering considerations. The general area between Highway 3 and the CN railway was selected, and further evaluated with specific regard to existing uses and engineering costs. The final recommendation of the consultants to MOE is to locate the interim lagoons on the eastern-most part of this area.

The lagoons are in an area designated for industry in the strategic plan.

Allowing for the appropriate setbacks from Highway 3 and the fill line of the streamcourse through the site, the southern part of this site can accommodate two cells with a maximum surface area of 13.8ha and an operating depth of 2½ m. This should be sufficient capacity for the expected growth up to 1980 and possibly 1981.

The northern part of the site above the stream-course can accommodate another 4.5 ha pond if required.

The lagoons may cause occasional odours. However, the prevailing winds are to the east and early development will be to the north of the lagoons and well outside the 200 m setback.

Although the average elevation of the site is approximately 3 m higher than the pond site, the difference is not sufficient to permit gravity flow. Therefore, the initial development area will be drained by a permanent sub-trunk sewer along the Nanticoke (see Section 5.71) down to a temporary pumping unit located near the CN track, and then by a forcemain to the ponds along existing or proposed road alignments.

Gravity flow of the effluent from the site to the creek is feasible. An easement for the outlet sewer will be required to the creek.

As the ponds are temporary, the subsequent use of these facilities for storm water retention has been considered and was found to be impractical. (See Section 5.73.)

Construction of the lagoons is expected to start in the fall of 1977, in order to be completed by August 1978.

4.42 Water Supply System

The new regional water supply system is expected to be completed by mid-1978 for the initial development.

The trunk watermain for Townsend from the Stelco industrial park up to Highway 3 will most likely follow the alignment tentatively agreed for the central trunk sewer.

Northwards from Highway 3, the present proposal by MOE is to continue the main to an elevated tank located near the middle of the development area. This elevated water tank (500,000 gal) is also required in the site by mid-1978 to provide pressure control and on-site storage. Ideally, it would be at the centroid of the ultimate population, and near a streamcourse suggested in this location. The tank could be 45 m high.

4.43 Hydro Supply and Telephone Service

Ontario Hydro presently plan to serve the initial development from the Jarvis Transformer Station with a 27,600 volt overhead service. The service will be taken from the hydro corridor paralleling Highway 3 about one km to the south, and probably enter the site along Townline Road. This service should be adequate

The telephone service to the new community could be provided by the Bell Telephone Company from the Jarvis switching station.



Initial Regional Services

- Water Transmission Main
 - Central Trunk Sewer
 - Watershed Boundary
- Indicative Alignments only

- Pumping Station (Sanitary Drainage)
- Water Reservoir & Pumping Station



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Source: MoE



Temporary Sewage Stabilization Ponds

-  Alternative Locations Examined
-  Recommended Location



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RECOMMENDATIONS

5.00 STRATEGIC PLAN

The strategic plan sets out the major land uses and circulation systems recommended for Townsend at its ultimate population of 100,000 persons. (See drawing in back pocket.)

5.10 Housing Areas

A preliminary development envelope for the 100,000 population level was defined in the first phase of this study. This envelope was slightly larger than required to allow additional time for investigating further a number of constraints, and to provide some flexibility when preparing the strategic plan. (See figure 5.10.)

A final development envelope for the 100,000 community has now been recommended for the strategic plan. This section reviews the basis for the recommendation, and some of its implications.

5.11 Land Requirements

The total development land that may be required at the ultimate planned capacity of 100,000 population is in the order of 2,270 ha (5,625 a). (See table 5.11.)

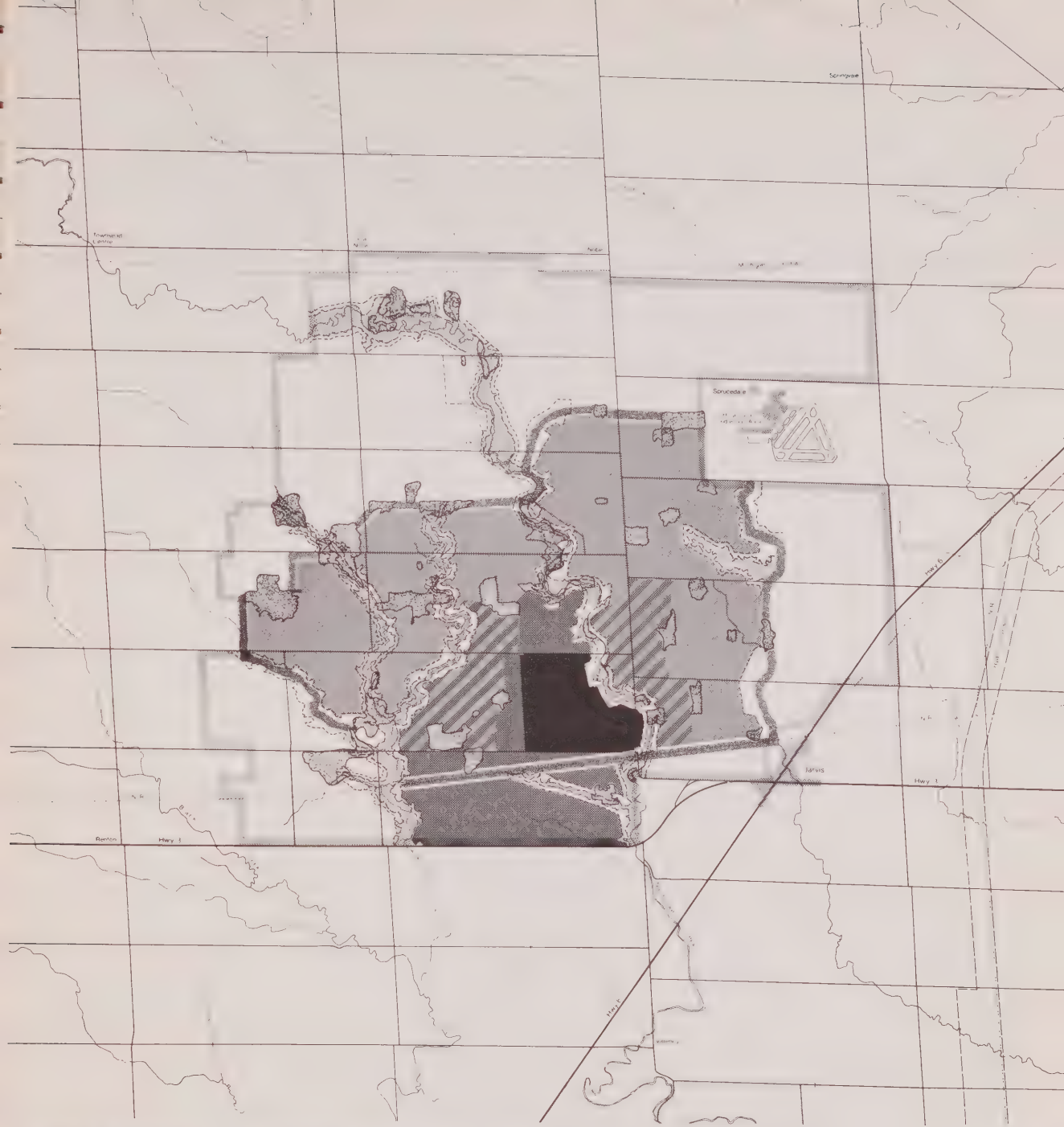
Table 5.11
Land Requirements (100,000 Population)

Land Use	Area	
	ha	a
<u>Neighbourhood Area</u>		
Net housing area:*		
low density	660	1,630
medium density	490	1,210
upper density	60	150
Local parks and pedestrian system	160	400
Elementary schools	40	100
Local shops and community facilities	5	10
	1,415	3,500
<u>Secondary Centres</u>		
Shopping facilities	25	60
Intermediate and secondary schools	40	100
Community parks	40	100
Community facilities	20	50
Local employment areas	10	25
	135	335
<u>Regional Centre**</u>		
Shopping and commercial facilities	30	75
Community facilities	20	50
Recreation facilities and open space	5	15
Vehicular and pedestrian circulation	25	60
	80	200
<u>Employment Areas</u>	200	500
<u>Major Open Space***</u>	240	590
<u>Transportation Corridors</u>	200	500
TOTAL	2,270	5,625

* the net housing areas include local roads

** the housing in the regional centre has been included in "neighbourhood area"

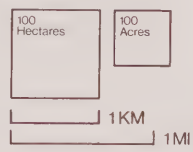
*** the area includes all lands within valleys and associated woodlots within urban envelope



Development Envelope for Urban Use

- Final Development Area
- Medium-Term Development Area
- Initial Development Area

- Flood Plain
 - Woodlots
 - Buffer Strip
- } Public Open Space



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The schedule includes a nominal area of 200 ha (500 a) for industry. As noted later (see section 5.40), the land that may be needed for this use cannot be presently quantified.

The schedule, however, excludes major parkland and recreation uses that can be allocated to the natural open space contained within the valleys. However, it does allow for recreation facilities and local parks required within the housing areas and regional centre. (See section 2.60.)

5.12 Land Availability

The total development envelope encompasses over 2,700 ha (6,700 a). Of this, nearly 2,500 ha (6,150 a) can be used for development if the land within the fill lines is included; and nearly 2,200 ha (5,400 a) if the fill lines are excluded.

The land available for development within the recommended development envelope can roughly accommodate the projected land needs of the 100,000 population. A shortfall of approximately 2½% would occur if no land within the fill lines could be used. In this event, or in the case of other unknown needs emerging, the 100,000 population could be still accommodated by slightly adjusting the housing density or taking additional farm land.

Table 5.12
Land Availability

Use	Area	
	ha	a
Farmland	2,800	6,920
Natural Areas*	380	940
Total in Rural Areas	3,180	7,860
Development Land	2,190	5,410
Valleylands: ⁺		
between fill and flood line	300	740
within floodplain	240	590
Total in Urban Area	2,730	6,740
TOTAL in Study Area	5,910	14,600

* public open space in Nanticoke valley and in valleyland, woodlots and buffer strip along edge of urban envelope

+ includes associated woodlands

5.13 Selection Basis

The final envelope has left out two major areas — the area in the southeast corner of Townsend, north of Jarvis and east of the Sandusk Creek tributary — the area in the southwest corner, west of the westernmost Black Creek tributary.

Southeast Corner

As noted in the first interim report, development in the southeast corner would be affected by many construction difficulties: gas leaks, shallow overburden, heavy clay and poor drainage. Despite these difficulties, this area was incorporated in the preliminary envelope for further study because it is on relatively poor agricultural land, and could be readily serviced from the regional infrastructure.

Further studies have shown the following:

- 1) The area will be separated from the main part of the urban area by the broad fill line along the Sandusk tributary, which is in the order of 700 m wide.
- 2) A piped storm water system for the residential development could not be constructed in the area, because its virtual flatness will not allow for the necessary gradient to accommodate the run-off.

For all these reasons, the development of this area is now considered infeasible.

Southwest Corner

The area in the southwest corner of the site is an attractive area and well-located near the regional infrastructure. However, it is also separated from most of the Townsend site by three branches of the Black Creek with their associated flood and fill lines, and a number of substantial woodlots.

The area also fringes upon an intensive and highly productive market gardening area directly west of the site. This area could be adversely affected by urban encroachment. The westernmost tributary of the Black Creek provides a natural barrier that can be developed into a buffer between the urban and agricultural areas.

If an additional area is required for the 100,000 population, or if Townsend grows beyond this size, the development of this area might be reconsidered. However, neither of these can be expected to occur until well after 2001, and therefore, the area has been designated for permanent farm use.

5.14 Medium Term Envelope

A development envelope for the 20,000 population level also will be selected in the next phase of this study.

Three areas were formerly identified as potential locations for this envelope:

- between the Black Creek system and the Nanticoke Creek;
- within the Nanticoke Creek watershed;
- within the Black Creek watershed.

The last option can be ruled out now because the initial development area has been located next to the Nanticoke. (See Section 4.10.)

The selection will be made on the basis of a number of considerations:

- the cost of the road and services infrastructure needed in each area;
- the difficulty of developing within an area under the jurisdiction of two school boards;
- the flexibility that can be left for the regional centre to accommodate long term growth, especially higher density housing;
- the use that can be made of the Nanticoke valley as a central spine to the community.

5.15 Planning Implications

Jarvis

The town of Jarvis is located to the southeast and just outside the lands acquired for Townsend. Jarvis has almost doubled its population in the last three years and it will continue to be considered by developers as a favourable growth community because of its crossroad location and future availability of trunk services.

A partial urban link with Townsend is possible to the west of Sandusk Creek. Continuous development to the north of Jarvis, east of the Sandusk, would cause drainage problems. In any case, as a residential community Jarvis would remain separated from Townsend to some degree because of the railway line. Housing development would be kept away on both sides of the railway line for some distance.

Whether Jarvis should grow and at what rate is a matter of regional concern. The form in which it should develop will also be influenced by the open decision about the Highway 3 bypass. For Townsend's early stages of development it would be helpful if Jarvis were not to compete.

Buffer Strips

A permanent buffer strip should be created to separate the ultimate development envelope from the surrounding agricultural areas.

Existing woodlots and well-defined valleys already form the basis of the buffer in the most important length along the top and the western edge of the community. These features must be supplemented by appropriate planning well in advance of development in the adjoining areas.

Across the eastern border of the envelope, the location of the buffer is less apparent. Although the buffer has been placed along two stream courses, the valleys are not pronounced and the associated woodlots sparse. Therefore, the location of this buffer may require further study.

5.20 Regional Centre

The regional centre is being planned as the heart of the new region as well as the new community.

The studies to date, as reviewed in this section, have focussed on defining the role of the centre, selecting its location and finally determining its possible size and land uses.

5.21 Role

The centre should contain most of the unique and one-of-a-kind facilities in the region. It should also provide the setting for the greatest diversity of goods, services, people and events in the area.

In fulfilling this role, the centre should contain all the functions traditionally associated with a major "downtown" area, including cultural, social, recreational, entertainment as well as shopping and business facilities. With the associated build-up of service employment, it should be a major place of work in the region. The concentration of activities also should make it an interesting and unique place to live.

The development of such a centre is intended to serve a number of purposes:

- It should assist considerably in creating an early and strong sense of community identity.
- The concentration of activity should also create the best opportunity for establishing comprehensive comparison shopping in the region.

- This in turn should serve to attract a greater diversity of employment, and the provision of other social and non-commercial facilities.

5.22 Location

The centre has been sited on the southern edge of the community, next to the Nanticoke valley and approximately 1 km north of Highway 3.

As shown in the plan, the site can be served by two major arterials for access from the region. Townline Road provides regional links with the Nanticoke industrial area to south and the Brantford area to the north. A new east-west arterial can link to the Simcoe area via Highway 3, and to the Hagersville- Caledonia area via Highway 6.

In the short-term, Townline Road provides immediate access from Highway 3, for early regional facilities. A new bridge over the rail line will offer a panoramic view of the centre when entering along this road from the south.

The location can be a central focus for the internal public transit system of the community. It should also serve as a convenient interchange point for work trips to the Nanticoke industrial area and other trips to regional activities. The Nanticoke valley provides a complementary and attractive route downtown for pedestrians and cyclists.

The proximity of the first housing will allow the centre to accommodate the early commercial and social facilities needed by the residents. These should serve to establish the centre as a focus of activity. (See section 4.10.)

5.23 Site

The site of the regional centre is relatively flat and featureless, and the lack of development constraints makes it suitable for large scale development. (See figure 5.23a.)

The Nanticoke provides a highly distinctive setting for special developments. The reclamation of the quarry site, the small valley in the southeast corner, and existing farm buildings along Townline Road provide important opportunities to create a local distinctive character.

The area designated for the regional centre covers approximately 90 ha (220 a). (See Table 5.24.)

The site is similar in size to that for new civic centres in other new towns in Ontario and elsewhere. (See figure 5.23b.)

The area is the same as that contained in that portion of downtown Toronto bounded by Yonge, College, Bay and Queen Streets. Walking time across the site would take about 15 minutes at a leisurely pace. (See figure 5.23c.)

5.24 Land-Uses

The range and scale of facilities in the centre will be affected by many factors. For preliminary planning purposes, an initial list of possible land uses has been identified, and their land requirements estimated

The land budget could require between 40-70 ha (100-175 a.) Land requirements for each element will depend on intensity of building, and most importantly, the provision of car parking. These requirements will be examined in the next phase, but for the moment, they do provide a reasonable basis for determining the overall adequacy of the site.

The maximum area required by the listed land uses could require more land than is available in the site, if all uses were built at the lowest possible intensity. However, this is not characteristic of recent comprehensive developments, even in a sub-urban location. Therefore, the land area reserved for the centre can be safely based on a more intensive urban character for the centre, with some mixing and stacking of uses and sharing of car parking space.

Commercial Uses

Townsend at its ultimate planned size could have a commercial core with about 93,000 m² (1,000,000 ft²) shopping space. This would be mostly comparative shopping space with 2 major full-line department stores and at least one junior department store, but also containing a variety of specialty shops (See section 2.30.)

The regional centre will also function as the local convenience centre for downtown residents and the immediately adjacent housing areas. Within the total figure noted above, 6,000-7,000 m² (60,000-75,000 ft²) has been included for a major super-market, drugstores and other convenience shops and services.



Proposed Site Regional Centre



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5.23a



1



6



2



7



3



8



4



9



5



10



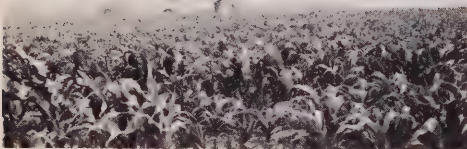
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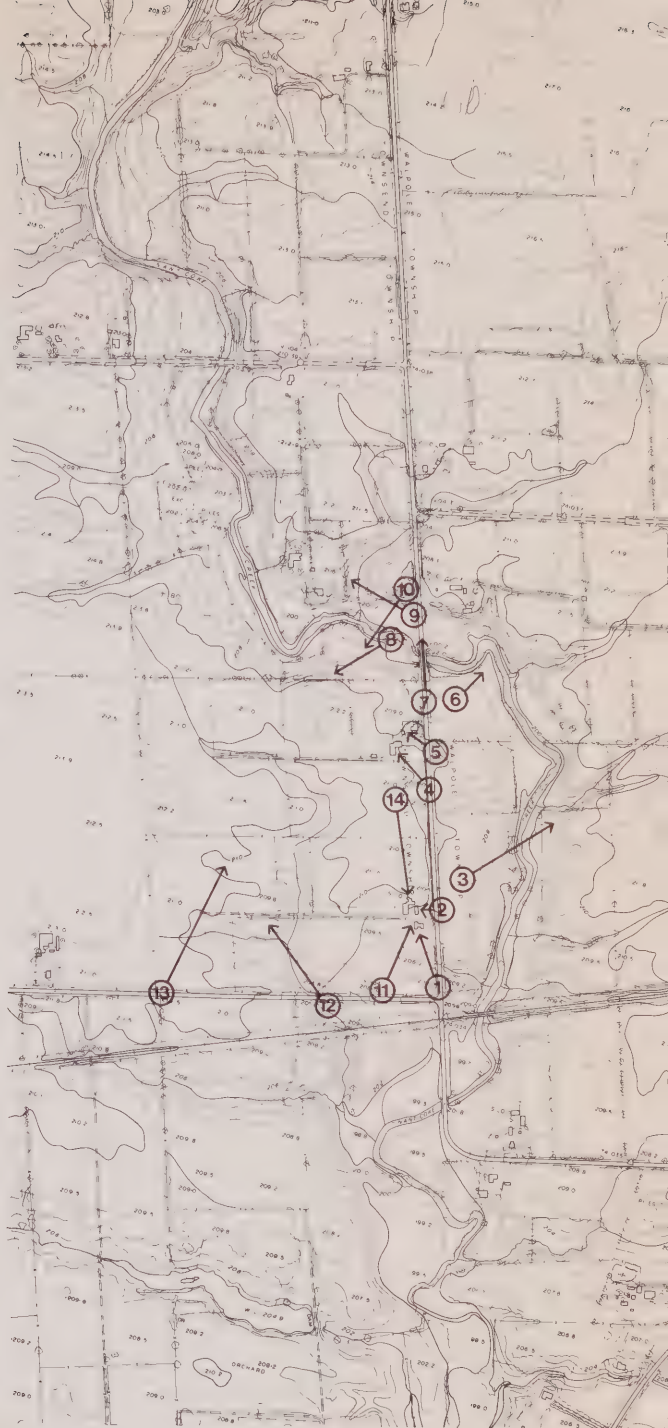
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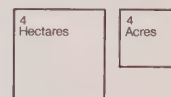


14



Visual Survey Regional Centre Site

① Photo Views



250 M
1000 FT

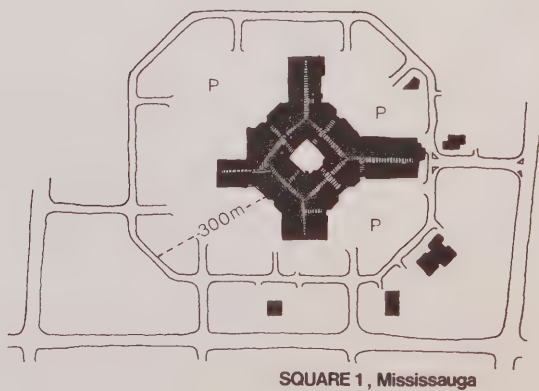
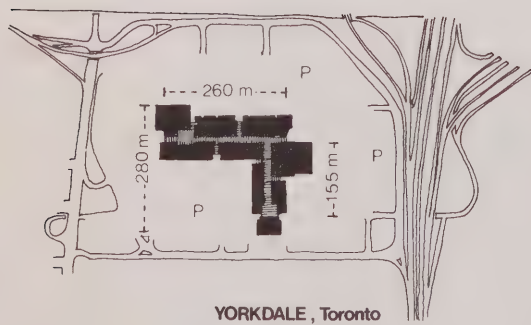
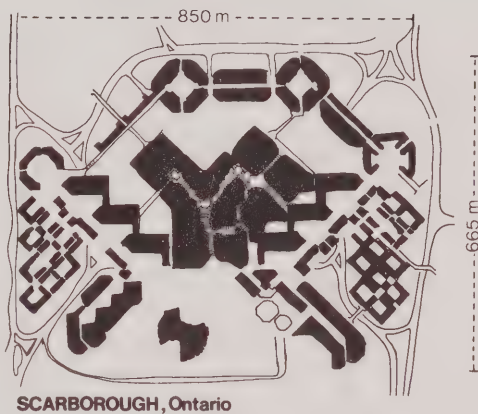
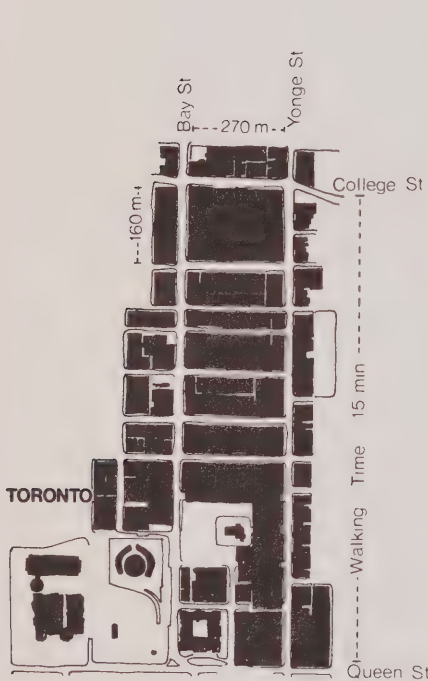
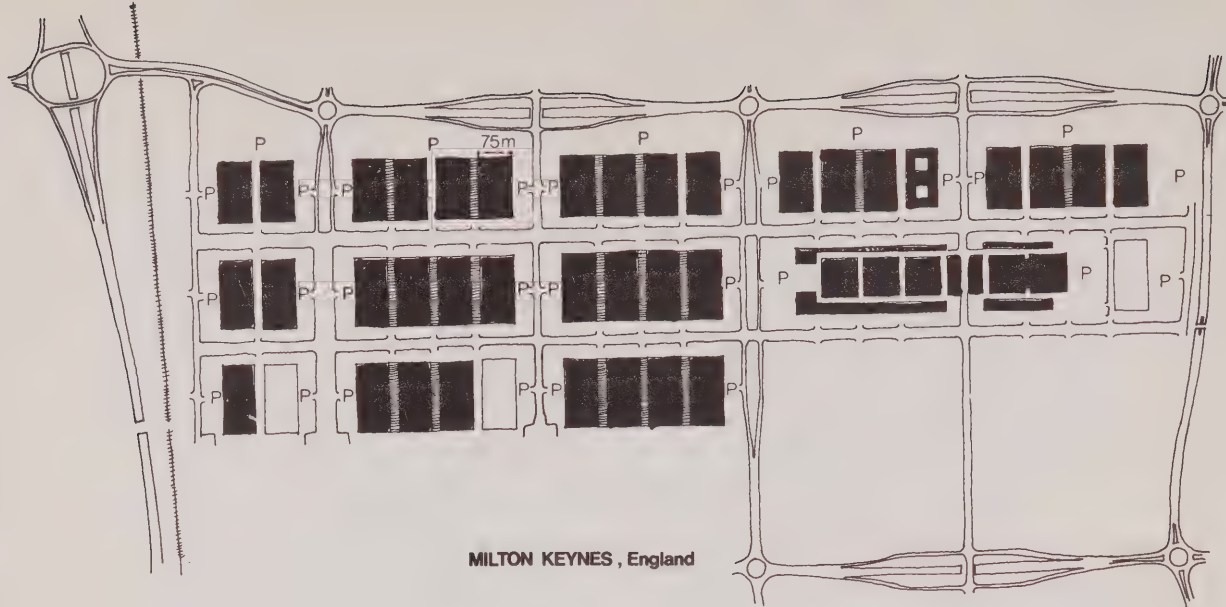


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5.23b



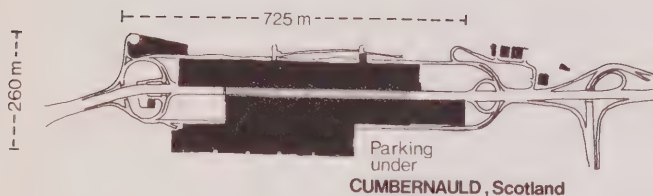


HARLOW, England

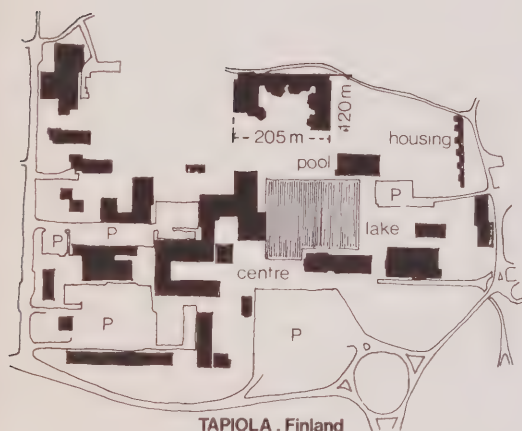


STEVENAGE, England

-  Buildings
-  Malls
-  Parkings



CUMBERNAULD, Scotland



TAPIOLA, Finland



RESTON
Virginia



CITY CENTRE SITE



COLUMBIA, Maryland

Comparable Centres



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Hotels will be needed to serve the Nanticoke industrial development as well as the major population base in Townsend. As a first estimate 300-400 hotel rooms has been projected for eventual development in Townsend.

Office Space

The major industrial build-up in the region will generate supporting service employment, most of which can be attracted to Townsend. A large part of the service employment is likely to be in offices located in the centre to take advantage of business linkages and other facilities.

Various governmental agencies — ranging from the local to federal — will require office space in the centre to administer the growing population. A site for a new regional administrative centre has already been agreed. (See section 4.20.) Other regional office uses that may be required include a police headquarters, registry office, and in the long term, perhaps accommodation for the school and library boards. The City of Nanticoke may also wish to build new municipal offices in the regional centre. The federal government will need space for Manpower, C.P.P., U.I.C., and the post office; and the provincial government for social and health services.

A modest amount of private office floor space also has been allowed for various small businesses, branch offices and professional services serving the local needs of the population.

The development agency for Townsend should require accommodation for its planning and administrative staff, which could include an information and marketing centre.

Education Facilities

An early community college campus could be developed in the centre to house extensions of the Mohawk College and McMaster University. (See section 2.61.) The community and region, with an anticipated enrolment of over 2,000 students, could eventually support its own community college.

The need for locating one of the public high schools in or near the centre, or for providing any special vocational schools, must be explored further.

Housing Areas

Some 6,000 of the Townsend residents could be accommodated in higher density housing. (See section 2.20.) These residents would include primarily single people, young couples without children and mature couples whose children have grown up.

Half of this housing has been incorporated in the preliminary budget for the regional centre; most of the remainder should be developed immediately outside the centre — for example, along the east side of the Nanticoke valley. The housing form probably would be mainly apartments, perhaps in maisonettes over shops, separate towers and in low-rise high-density terraces overlooking the Nanticoke. The "downtown" community would provide a special type of living environment, adding liveliness to the centre and diversity to the housing stock of the community.

Recreation and leisure uses

The regional centre could expect to accommodate the following open space/recreation uses:

- a large civic square for civic events, parades, rallies, exhibits, skating and sitting.
- an indoor all-year sports centre with swimming pools, gymnasia, and courts for squash, badminton, tennis and other activities.
- sports fields to be shared by the community college and general public.

In addition the Nanticoke valley on the edge of the centre should be developed into a town park with places for walking, cycling, sunning and other passive pursuits.

Additional amenity space can be expected throughout the centre in the form of various pedestrian malls and landscaped plazas.

Car Parking

Parking will constitute the largest single land use in the centre. If the needs of every land use were treated individually, about 10,000 spaces could be required when the centre reached full capacity. The parking would cover an area of approximately 28 ha, if all vehicles were to be accommodated at grade. However, in a comprehensively designed and mixed-use centre there should be many opportunities for sharing this need, as well as utilizing multi-level parking structures.

Table 5.24
Preliminary Land Requirements for the Regional Centre

Land Use	Area	
	ha	a
Commercial Uses:		
shopping	15- 25	37½- 62
offices		
hotels	5- 10	12 - 25
entertainment		
Community Facilities:		
community college	10	25
hospital	2	5
others	6	15
Open Space and Recreation Facilities	5	12
Residential Areas	20- 30	50 - 75
Vehicular and Pedestrian Circulation	15- 20	35 - 50
TOTAL	78-108	192 -269

Other facilities

A host of major community facilities that can be expected within the centre include theatres, a central library, an art gallery, a museum, and a community centre.

Space has also been reserved for community health facilities. In the later stages of the Townsend development, it is likely that a general or active treatment hospital accommodating up to 400 beds will be required, associated with a public health building, a nursing home and other special facilities.

Transportation facilities within the centre will include a central bus station in order to provide a convenient interchange point for regional services and serve as a focus for internal transit services.

5.30 Road System

The strategic plan contains a town-wide road system encompassing regional arterials and major collectors.

5.31 General Characteristics

The proposed road system is a rectangular grid layout adjusted as necessary to relate to the topography and natural features of the site, and modified to reflect primary traffic movements.

Grid road systems are particularly appropriate for new community development. They provide a relatively even level of accessibility and service throughout the town. This serves to distribute traffic flows over a number of roads, and to create a number of alternative "opportunity" sites for development. As a consequence, the road system could accommodate different and unforeseeable activity patterns.

The grid should also facilitate rapid growth. Short links in the system can be readily added or upgraded as needed. It also sets out a regular infrastructure, shared by trunk engineering services, that often must be fixed well in advance of development.

The system also differentiates between two types of road: regional arterials and major collectors. This is intended to separate traffic entering and leaving the community from traffic circulating within the town. The needs of the two movements are different, and in some cases in conflict.

The major arterial system will serve mainly traffic to and from the regional centre, the major employment areas, and other major facilities. This traffic should be carried through the town as efficiently as possible on roadways designed to provide reasonable speeds and minimum interference to the traffic. To serve this purpose, these roads make logical and continuous road connections to the external road system. For orientation and clarity, they also maintain as far as possible their essential directionality.

The major collector roads will be primarily for internal traffic needs. They will accommodate the short-distance trips feeding the major arterials and providing access to the local facilities and housing areas. Because they need not carry major traffic movements, they can be designed to become spines to the residential fabric, along which the local facilities can cluster and the bus service can operate.

5.32 Detailed Description

Regional Highways

The new alignment for Highway 6 between Hagersville and Highway 3, as defined by the Ministry of Transportation and Communications (MTC), has been shown in the plan. However, the second option — swinging the road to the west to follow regional road 55 on the edge of the site — also could be incorporated as well.

Highway 3 has been shown widened on its present alignment, but with a possible bypass around Jarvis. Both improvements should be consistent with the policy statement for Highway 3 presently being prepared by MTC.

Regional Arterials

The anticipated traffic flows for the 100,000 population level in the evening peak hour have been analysed to identify the major traffic movements within the new community and between the community and the surrounding region. This has been used to determine the structure and size of the town road system, and the need for major road linkages to the outside.

Most of the total traffic movement within the evening peak is entirely within the community. However, the inbound traffic to Townsend from the Nanticoke development is considerable, and indicates the need for four northbound lanes between this area and Townsend.

Townline Road and the existing north-south road to the west have been planned to serve this function. Both will directly link the housing areas to the major employment areas at Nanticoke. Both are laid out as 4 lane arterials (2 lanes each direction), but within a right-of-way sufficient for 6 lanes if required.

Regional road 55 would serve as an additional facility for this work traffic to and from the eastern side of the community.

Major traffic flows also can be expected off the Highway 3 corridor, particularly from the west, to both the residential areas and the regional centre. For this reason, a diagonal link has been shown in the southwest corner of the site between Highway 3 and the southernmost east-west arterial in the community.

As an alternative, the middle north-south major collector in the community could also serve this function by linking to Highway 3. The need for this link depends largely on the build-up of industrial development in the southern employment area.

A major arterial has been located on the southern edge of the community, running from Highway 3 at the western boundary of the site and terminating at an interchange with new Highway 6. A diagonal connection to Highway 3 has been shown to facilitate traffic movement. In the long term, if traffic warranted, this road could be extended further east beyond Highway 6 along an existing concession line to link back again with Highway 3.

This arterial has been planned with four lanes, but a maximum lane capacity of six lanes has been located on the southern edge of the community to provide convenient access to the regional centre without taking the traffic and its associated noise through the residential areas. By paralleling Highway 3, this road also will serve to relieve turning movement from Highway 3 on to busy north-south arterials taking traffic from Nanticoke.

A second east-west arterial has been also provided through the middle of the community. This is shown interchanging with Highway 6 to the east, and connecting to an existing concession road to the west. To facilitate regional movements, the road most likely should be designed with limited access. However, because of the nature of the surrounding development, it is unlikely to need more than 4 lanes in total ultimately.

5.33 Internal Roads

The internal major roadway system is a regular grid composed of these major arterials and an overlapping series of major collectors.

Four east-west roads, including two regional arterials, are provided at spacing of approximately 1 km. The five north-south strands in the system, including the two regional arterials, are spaced at about 1½-2 km.

The major collectors run across the community, but terminate within its borders. The design capacity of these roads, except around the regional centre, probably will be for 2 lanes, but most likely they will be built to 4 lanes for operational reasons.

As noted, the middle north-south collector could be extended to serve the industrial area along Highway 3.

The existing concession roads west of Townline Road have been retained as much as possible for two main reasons:

- to retain the existing development and roadside trees;
- to capitalize on existing road infrastructure, especially the crossings of the valleys, which can be used for local residential traffic after the arterial system is completed.

5.34 Planning Implications

The road system will affect the design and layout of many features of the town. Therefore, some of the implications of the proposed system are reviewed below.

Activity Centres

The road system in the strategic plan has not been based upon a specific distribution of local facilities. Rather, to provide for changing development patterns and lifestyles over time, the road system has been set to form a general matrix of different types of "opportunity sites". Within the matrix, different facilities over time will be able to "seek their own level" of access and visibility, consistent with their individual requirements. For example, those facilities that require both regional and town-wide access and visibility will tend to locate at the intersection of major arterial roads. On the other hand, local centres serving housing areas can be expected to locate adjacent to major collector roads, but with good pedestrian access.

Development Parcels

The major road system should be spaced sufficiently wide so that the residential areas can be developed without interference from major traffic. The area typically contained in the housing defined by the major arterials and major collectors would be 150 ha. Allowing for the various densities that could be developed, and the development land lost to valleys and woodlots, each of these areas might contain about 7,500 persons on average.

Public Transit

In the road system proposed for Townsend, the local bus services must be run on the collector roads within the housing areas, in order to satisfy the planning criteria that all housing should be within a maximum of 400 m of a transit route. (See Section 5.60.) The implications of this routing on

local road layouts and intersection design must be more fully explored in the detailed housing studies. The emphasis will be on minimizing route mileage and unnecessary delays, while also providing feasibility for different routes over time.

Traffic Operations

The major arterials might have signals at every 400-500 m. This spacing should allow for the use of signals to coordinate the orderly flow of traffic at reasonable speeds through the network.

Design Standards

The functional and performance characteristics of the system will be based on current recommended practice, modified to some extent to reflect certain design considerations. The major modification to current practice probably will be in the rights-of-way. In general, to provide flexibility and accommodate landscaping, the corridors for the major arterials and major collectors must be wider than normal. Although this will add to the overall land requirements for roads, it can be made up many times by reductions in the widths of the local roads, which as presently laid out can accommodate traffic far in excess of the actual requirements and of acceptable environmental standards.

5.40 Employment Areas

One site has been designated in the strategic plan, and another held in reserve, for industrial development and related uses.

5.41 Prospective Employment

Any heavy industry moving to the region, in addition to that already being developed at Nanticoke, is unlikely to seek or be permitted to locate in Townsend. The potential problems of congestion and pollution probably will be too great, and the land costs too high, especially when compared with the apparently ample alternatives elsewhere in the region.

It is expected that Townsend will be able to attract a certain amount of light industry over the next 10 years. In fact, inquiries from interested industries are already being received by the Townsend

Program. Some growth in light manufacturing will probably occur in addition to that at the Stelco industrial park. However, Brantford's industrial park is in a better location for major markets and transportation links, and Simcoe and Dunnville have competitive industrial parks attempting to attract tenants. Some of the anticipated growth also will be due to expansion of existing industries that will not necessarily relocate their operations.

These conditions could change over the long term as Townsend emerges as the regional centre and a major population base. Service employment in the region will grow substantially in response to the industrial development at Nanticoke and Townsend. Some firms in this sector will use industrial sites if they are well located near regional roads and attractively landscaped. Land will also be required for various utilities and services, like the temporary sewage lagoons, hydro stations and public works depots.

Therefore, although no market demand can be quantified at this time, some industrial land should be available for development.

5.42 Potential Sites

The site that has been designated for early industrial development lies between the two creeks along Highway 3 below the CN railway on the southern edge of the site.

The site that should be held in reserve for development potentially in the long term is in the area just outside the northeast corner of the urban envelope near Highway 6 and south of Livingstons. This site has been given second priority because it is more remote from the development area for Townsend. The storm water management in the area also will require further investigation before development could be undertaken. (See section 5.73.)

Both areas are suitable for industrial use because they are both on the periphery of the urban area, on relatively flat land and adjacent to major regional roads and services. Both contain approximately 200 ha (500 a) of development land. The size and dimensions of both sites could provide efficient layouts for the full range of lots expected in a light industrial area.

Depending upon the mix of uses, and the intensity of development, each area could reasonably accommodate between 3,000 and 6,000 jobs.

5.50 Open Space

The open space in the plan has been designed to preserve the major natural features on the site and at the same time provide ample open areas for both active and passive recreation

5.51 Linear Park System

The major open space of the community has been set within a town-wide linear park system. The major elements in this network are the valleys of the Nanticoke, Black and Sandusk creeks and their tributaries. These three creek systems provide natural corridors in the north-south direction and will connect the site to recreational facilities along the lakeshore. The Nanticoke creek also can connect northwards to the Waterford Conservation Area.

The inherent natural features of the valleys of these systems offer a variety of recreational opportunities: trails for hiking, bicycling, horseback riding and cross-country skiing; and facilities for warm-water fishing, tobogganing, skating ponds.

A major east-west open space corridor also has been proposed through the middle of the site, connecting the valleys and providing a natural buffer between the urban and agricultural areas of the site. A number of woodlots and hedgerows can be reinforced with new planting to provide this natural corridor which should be 100-150 m (330-500 ft) wide throughout.

At this stage, the strategic plan illustrates only the major open space components of the network. This network should also contain a finer mesh of local parks and pedestrian links in the residential areas and throughout the town.

At the more local scale, the existing drainage courses where possible should be used as the basis for the residential open space links between local residential areas and other wide community functions. They can be used as pedestrian and bicycle routes linking the local residential areas with community facilities.

The quality of these existing drainage courses should be enhanced by planting and landscaping, by creating ponds which will also serve as storm retention areas.

The entire open space system should provide a continuous network of parks and trails, relatively free from vehicular traffic and linking all the main activity centres in the new community to the residential areas.

5.52 Urban Parks and Recreational Facilities

The town-wide open space network should incorporate a series of parks, ranging from tot lots to extensive recreation areas.

Town Park

A large town park is proposed in the Nanticoke valley adjacent to the regional centre. The valley area itself should be used for passive recreation only, that could include an open-air bandshell theatre, small pools and waterways, botanical gardens, pedestrian trails, picnic areas with shelters and cooking facilities, and nature interpretation facilities. The indoor and more intensive recreational components can be developed in the central area along the valley rim.

The existing quarry next to the Nanticoke stream course provides an opportunity for creating a number of special recreation features. (See section 3.12.) A pond up to 4 ha (10 a) in size could be developed for fishing, boating and skating. A smaller pond of 1½-2 ha (3-5 a), although primarily for storm water retention, also could serve as a wildlife area for geese and ducks. The associated embankments in the area also could be graded for sledding and tobogganing.

Community Parks

The more intensive and active recreational needs of the population should be catered for in a series of community parks. One such park with approximately 10 ha (25 a) should be provided for every 15,000-20,000 persons. This would place one within a ten-minute walk of everyone's house. These parks should be located near the valleys to utilize their natural amenities for associated passive recreation uses. The secondary school could adjoin the community park to supplement and share indoor recreation facilities.

The recreational facilities of these parks should be developed in response to the particular needs of each individual community. One example of a possible land budget for one of these parks has been provided to illustrate the facilities that could be developed within the recommended standards. (See table 5.52.) In general, these facilities are orientated toward use by adults and older children.

Neighbourhood Parks

Neighbourhood parks of 2-3 ha (5-8 a) also should be provided for the local open space and recreation requirements of every 4,000-5,000 people.

Table 5.52
Possible Open Space Facilities

Local Parks

Tot lots	150m ²
Equipped playground (1/250 dw)	1,500

Neighbourhood Park (for 4,000-5,000 persons)

Junior playground	1,000m ²
Senior play area	1,000
Hard surfaced area for multi-use court games	2,000
Softball diamonds with overlapping soccer pitch (2)	12,500
Junior soccer free play area	5,000
General garden, sitting and picnic area, wading pool	3,500
Tennis courts (2)	1,500
Parking for 10 cars	500
General allowance for irregular shape, buffer areas, and miscellaneous spaces	3,000
Total Area	3.0 ha

Community Park (for 15,000-20,000 persons)

Fastball baseball diamond	12,500m ²
Indoor arena/recreation hall	2,500
Football and soccer field with 1/4 mile track	25,000
Free play/athletic fields	10,000
Court games area	2,000
Lawn bowling	11,500
Indoor pool	1,500
Tennis courts (4)	3,000
Garden, picnic and passive areas	20,000
Parking for 100 cars	4,000
Miscellaneous space	8,000
Total Area	10.0 ha

In most cases, these parks should be adjacent to the local elementary school, to allow for the dual use of the local open space. Where possible these parks also should be located near drainage courses, which in turn will provide pedestrian connections to the adjacent neighbourhoods and other community facilities.

The neighbourhood parks could include a range of facilities, orientated primarily towards children's play. (See table 5.52.)

Additional open space should be provided within the housing areas in the form of walkways, tot lots and incidental amenity areas.

5.53 Special Recreation Areas

The small settlement of Rockford in the centre of the site represents an opportunity to develop a 19th century rural village. Once a rural service centre of 50 people, with a hotel and four mills, it now contains a cluster of historic buildings including a former schoolhouse, church and cemetery, a few houses and vacant structures. Nearby, there is also a small waterfall, the former mill sites and an archaeological site in the Nanticoke valley.

The former atmosphere of this village could be created by constructing the former dam and millpond in the valley. A number of other compatible recreational facilities could be provided, like a small native animal zoo, demonstration farm, or a sugar bush plantation. Also, while the other historic and architecturally significant buildings should be retained as far as possible in situ, if this is not possible, their removal to Rockford should be considered. Such a complex could become a major open space amenity and regional tourist attraction.

5.54 Environmental Management

The hierarchical and linked open space system is also seen as a suitable framework for an integrated management program of wildlife and ground flora habitats. The system will create a wide mixture of natural and man-made habitats that should encourage a diversity of native wildlife.

The system will also provide a number of open space corridors for the movement of wildlife through the site. The primary corridors will be the north-south valleys and the east-west buffer strip. The secondary

links can follow the storm drainage channels, servicing easements, old hedgerows, vegetation buffer strips, town-wide pedestrian system or any other open space of 20 m or more wide.

Specific management practices can be prepared for the various landscape zones. When a more detailed environmental management program is developed, many of these areas should be designated as nature preserves or wildlife sanctuaries to ensure that priority is given to maintaining the natural habitat rather than to parkland. One possible wildlife preserve is a 40 ha marsh on the upper reaches of the Nanticoke on the potential floodlands.

5.60 Public Transit

Public transit is increasingly being planned and supported as a public service. This reflects the growing commitment not only to serving the many without any other means of transport, but also to lessening the use of private vehicles.

Despite this emerging priority, the transit planning must realistically match both what the community wants and can afford. A balance must be struck between providing an effective service to attract greater ridership, and efficient operation to ensure an economic system.

The transit planning for Townsend to date has concentrated on identifying the role and nature of transit in Townsend, and formulating planning principles to ensure that the strategic plan can accommodate an attractive and efficient system within an acceptable minimum of additional subsidy. More specific transit proposals will be developed in the next phase of work; various financial and management issues also will be examined.

5.61 Role of Transit

Public transit in Townsend has been assessed on the basis of experience in communities with similar characteristics, taking particular account of the expected population of 100,000 and the concentration of employment outside the site.

The potential role for transit first of all must be seen in terms of its competitive relationship with the automobile. Public transit cannot provide the convenience offered by the private automobile. Any attempt to do so would be prohibitive in terms of total transportation costs.

Townsend's specific situation also will limit the role of transit in a number of ways:

- 1) As a new and independent community, Townsend will lack the advantage of a nearby metropolitan area with an existing transit system and established community habits.
- 2) Because of the rural location, Townsend residents especially in the early years will be dependent upon the automobile for many activities outside the town, like major shopping, entertainment and recreation trips.
- 3) The work shifts at Stelco, and the generous parking facilities and open layout at the industrial park, all will work against transit usage.

Within this context, the modal split to transit — the proportion of the total trip using transit — is expected to be 3½-7% for the all-day period. Achieving a higher modal split to transit will depend greatly on any reduction in private car usage due to higher operating costs, traffic congestion or parking restrictions.

Public transit in Townsend, therefore, should be directed at the very least toward providing an effective means of transportation for the individuals who are without access to an automobile by virtue of health, age or income. As far as reasonably possible, it should also encourage wider transit usage by providing an attractive service for those who have no choice as to mode of travel. Finally, the system must be made capable of responding to increased demand if the present competitive advantage of the automobile changes.

5.62 Type of Transit

Given the Townsend situation, buses are the most effective form of transit for both operational and planning reasons. Conventional bus systems can accommodate flows far in excess of the transit trips that can be optimistically projected along any single corridor of movement in Townsend. A bus system can be initiated from the outset of the new community and be expanded as it grows. Because the system shares road space with cars, initial capital costs are kept low, access to all uses can be provided, and routes readily altered as necessary.

Fixed Route vs Demand Responsive Services

The choice of the most appropriate bus system is between a fixed route service or a demand-responsive service, popularly referred to as "dial-a-bus". Fixed route services follow a prescribed route, and passengers are picked up or dropped off at set stops. Dial-a-bus systems typically use small buses that can be called in advance to pick up passengers at their doorstep; they then carry passengers either to a final destination or to an interchange point with a fixed route service.

Past experience with both types of service clearly indicates that a fixed route service eventually will be the most effective form of transit for Townsend, given its planned population size and development density, and the anticipated transit usage. In the early years, however, a demand-responsive "dial-a-bus" system may be used as an interim service until demand reaches a level sufficient to support a fixed route service.

Special Services

Public transit ideally should be a comprehensive system serving all trips. Providing separate systems — for example, for schools or work journeys — not only duplicates equipment and staff, but also undermines the more general system needed for many other but less definable types of journey.

Meeting this objective may not be possible, however, in providing services for the handicapped and industrial workers. Transit services for the physically or mentally handicapped are difficult to combine with the regular operations because of the physical problems of the handicapped and the specialized nature of the demand.

Bus services to industrial areas also have been traditionally difficult to implement because of shift changes, free parking and open layouts. A basic routing system focussed on the main central activity area, like the regional centre, cannot provide also direct service to the outlying industrial parks. Furthermore, transit is competing with carpooling that can provide comparable user costs while closely approximating the convenience of an automobile user.

Therefore, in addition to the basic fixed route system for most of the trips within the community, specialized secondary services may be also required for these two purposes. Nevertheless, all of these systems should be planned and coordinated by a single

transit authority, responsible for integrating the operations in order to maintain a high overall level of service and utilization of equipment.

5.63 Planning for Transit

Bus systems will be developed for various stages of development in the next phase of this study. However, because the structure of the community can significantly affect the efficiency of the transit service, a number of planning policies have been established in preparing the strategic plan.

Routing Policies

The bus system should focus on the regional centre. Because this multi-purpose centre will be the major focus of activity in the community, this routing will assist transit by creating a single major destination for a variety of trips throughout the day. Patronage also will be encouraged because a single trip can be used for more than one purpose without transfer.

The centre also should contain a transit passenger terminal, where transfers can be made between all local and regional services.

Secondary multi-use activity centres should be used as a focus for the individual local services. These local services probably should loop through the housing areas, perhaps on a fixed schedule, to collect patrons over a wide area, before stopping at the secondary centre and proceeding to the regional centre.

Between the secondary centres and the regional centre transit will be concentrated in a limited number of trunk services in order to generate a fast and frequent service.

Some form of preferential access for transit — like bus-only lanes or special turning privileges — may eventually be required in the regional centre in order to maintain operating speeds and schedules. These measures are not likely to be needed elsewhere because the planned road system should limit the incidence of traffic congestion, and the transit volumes on any route will not justify the additional capital expenditure.

Within the housing areas the bus services should be run primarily on the collector roads, which also will be the focus of most residential activities like local shops and elementary schools. In laying out the local routes, a balance will be sought between attaining a high level of accessibility by spreading the system to reduce walking distances, and attaining a high frequency of service by focussing the buses on a limited number of routes.

These routes should be laid out so that no house is more than a maximum of 400 m walking distance from a transit route. Furthermore, all high density housing should be within 200 m. Bus stops will probably be provided every 100-200 m along local roads, but stops along arterial routes will be less frequent to attain higher operating speeds.

A special transit service for trips to the Nanticoke industrial area probably must be developed. This service must be particularly direct and convenient in order to attract ridership, considering the competitive advantages of the automobile. During the peak road periods at the shift change, this special service probably will be an independent system overlaid on the internal routes for the town. During the off-peak hours, an extension of the internal routes from the regional centre will be probably used to periodically serve this area.

Service Policies

The frequency of servicing during the peak period is generally geared to demand, while the off-peak service is usually regulated by social policies about the minimum level of service. For Townsend, the minimum frequency probably should be one bus every 15 minutes during the peak period, and 30 minutes for all other hours of operation.

The hours of service should be approximately 18 hours per day on all routes, Monday to Saturday. The time should be related to the hours of activity within the community and the Nanticoke industrial area. All service on Sundays and holidays probably would be significantly reduced to match the expected demand.

In order to ensure that the routes are understood, changes should not be made between peak and off-peak, except in the frequency of service.

Transferring from one vehicle or route to another is a strong deterrent to transit use, but some transferring will be required to limit the number of routes. Although difficult to establish as a firm standard, no transfer should be required in a trip to the regional centre and the local secondary centre, and no more than one transfer should be required between all points in the system.

5.70 Engineering Services

The new trunk services for the new community have been laid out in principle. In the next phase of work, these will be detailed further, for the medium term development area.

5.71 Sanitary Drainage System

The new regional sanitary drainage system will serve the community. However, because this system will not be operational until 1981, interim treatment facilities must be provided for earlier development. (See section 4.41.)

All of the development, with one exception, will be served by internal sanitary systems within the Nanticoke and the Black watersheds. Each of these two systems will drain to a pumping station located near the southern end of the respective stream course near Highway 3. Both of these pumping stations will link to the central trunk sewer (See figure 4.40.)

The exception is the possible long-term industrial area in the northeast corner. The drainage system for this area would link directly to the Hagersville trunk sewer.

The area served by the Nanticoke sub-trunk sewer will be extended on the east up to the fill line of the western tributary of the Sandusk Creek, and will also include the major part of the area between the Black and Nanticoke Creeks. The topography outside the valleys is generally flat with a gradual slope from north to south; this provides flexibility for establishing the sanitary drainage area boundaries between the natural watersheds.

Each watershed will be drained by a system consisting of a sub-trunk sewer, collector sewers and local sewers. The sub-trunk sewers will follow the major watercourse either within or immediately adjacent to the creek valley, and will outlet to the corresponding pumping station. Collector sewers will follow the arterial and major collector roads or the pedestrian/open space system, with local sewers following local streets.

The Nanticoke sub-trunk sewer will follow Nanticoke Creek to the northern boundary of the development. The northern half of the sewer, approximately, will be twinned with one pipe on each side of the Nanticoke, the invert level of both sides being above the bed level of the Creek. These will be combined for the southern section in a pipe that will be below both the creek bed and bedrock levels. River crossings will be required to connect the collectors to the trunk sewer.

The Black Creek sanitary drainage area is formed by five sub-drainage areas delineated by the tributary watercourses. Each will be served by a separate collector sewer connecting to a pumping station located near the confluence of the watercourses.

5.72 Water Supply System

The water will be supplied from the new regional system by a new watermain from the south. The new main will either enter the site along Townline Road, or along the route of the new central trunk sewer. The latter is more likely because the route of Townline Road may not be agreed in time.

A ground storage reservoir and pumping station will be located at Highway 3, approximately midway between the two streamcourses. (See figure 4.40.)

Storage for the initial development will be provided by an elevated tank located within Townsend. (See section 4.42.) This tank will be required in the ultimate distribution system for the pressure control system.

The watermain network within the development will consist of a ring main of 24" to 36" diameter pipes, interconnected and looped by 12" to 24" diameter pipes. The network will be developed in looped sections, each corresponding to a stage of development.

5.73 Storm Drainage System

The Black and Nanticoke Creeks will take the run-off from the development area. The development will be divided into nine storm water drainage areas, outfalling to the Nanticoke and Black Creeks. The two drainage areas outfalling to the Nanticoke from the east will be extended to include the part of the Sandusk Creek watershed within the development envelope. The two drainage areas on the west side of the Nanticoke will be extended to include part of the area east of the Black Creek tributary.

The five drainage areas outfalling to the Black Creek will correspond to the areas between the tributaries.

A piped storm sewer system cannot be used in the Sandusk Creek watershed except in one small area. A piped system could not outfall to the natural channel due to the shallow depth of the Creek and the relatively small difference in elevation from the adjacent lands.

The long-term industrial area north of Jarvis may require a surface drainage system with swales and channels outfalling to the Sandusk tributary that flows southeastwards under Highway 6 south of Livingstons. This requirement will be subject to further detailed investigation before this area is developed.

The storm drainage system will consist of two parts: an underground piped system and an overland flood route. The whole of the development will be served by a piped system, which will accommodate the stormwater run-off from the design storm occurring at reasonably frequent intervals. The flood route using roads, walkways and natural watercourses will accommodate storm water flows that exceed the capacity of the piped system. Both systems will outlet to retention facilities prior to outfalling to the receiving watercourse.

The retention facilities will provide storage for controlling the peak flow discharges to the design limit of the watercourses. They could be also linked to treatment facilities that may be required in the future. The envisaged facilities are surface storage basins; underground storage tanks are an alternative. The storage basins can be designed as ponds in a park setting; this would require that a relatively constant water level be maintained, or as basins which are emptied after each storm event.

A number of potential locations for the retention ponds have been identified in natural depressions and valleys, and their maximum capacity calculated. (See figure 5.73.) In the next phase of this study, the storm water run-off in the development area will be forecast, and the actual need for these various ponds determined.

The use of temporary sewage stabilization ponds after 1981 as storm water retention ponds was reviewed, and found to be impractical. The use of the ponds, located remote from the development area south of the CN track, would require a considerable extension of the trunk sewers. In addition, the ponds would have to be deepened by at least 3 m to accommodate the gravity outlet.

5.74 District Heating

A preliminary assessment of a district heating system for Townsend showed that district heating would be roughly equal in annual cost to conventional heating systems in each individual building. District heating would use less and lower grades of fuel than conventional systems, but would require significant capital investment in heating plants, distribution network and transmission mains. Heating energy may be available for Townsend from the Nanticoke Generating Station, or perhaps as an alternative, the Stelco steel mill and the Texaco refinery. However, further analysis will be required to determine the availability and price of energy from these sources.

In this district heating scheme, a central heating plant, oil- or gas-fired, would be used with a distribution network of underground hot water supply and return pipes. At some point in the future, transmission mains would be constructed to deliver heating water from the Nanticoke Generating Station to the central heating plants in Townsend.

Although in the long term the prime source of heat could be from Nanticoke, its full heat production capacity will be periodically needed for the generation of electricity. At these times, the plants in Townsend must be available to supply the total demand for heating.



The heating costs at that time for district heating were estimated to be roughly equivalent to that for conventional heating energy. As a first estimate, the annual fuel consumption for heating in Townsend in the year 2001, using conventional systems, could be reduced by 20% and a lower grade of fuel used by a district heating system.

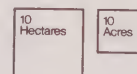
Estimates of the capital cost of district heating are \$86 million by 2001 for a system connected to the Nanticoke generating station by transmission mains. This capital cost would be \$53.5 million if the boiler plants were located within Townsend only.

With the cost of supplying heating energy by district heating about the same as conventional systems, the major consideration becomes the trade-off between the high capital expenditure on district heating in the short term and the possible savings on fuel consumption in the long term.



Potential Storm Water Ponds

-  Basic Water Level
-  Maximum Water Level



Date Sept. 76

TOWNSEND
COMMUNITY DEVELOPMENT PROGRAM



RECOMMENDATIONS

6.00 AGRICULTURAL AREAS

A large part of the Townsend site will remain in permanent agricultural use; and most of the land proposed for urban use will not be developed for many years. The provincial government intends "to have as much farm land producing food as is possible, on both an interim and long term basis, while at the same time allowing for the staged development of the New Community"*.

This section describes the agricultural zones of the site and associated leasing policies.

The Townsend site can be divided into four separate areas: (See figure 5.10.)

- 1) Initial Development Area: area required for the initial stage of development for the first 5,000 population and the town centre targeted for approximately 1981.
- 2) Medium-Term development: the area required for the 20,000 population threshold at 1986 approximately.
- 3) Long-term Development Area: the area required for the ultimate urban development.
- 4) Permanent Agricultural Area: the area not required for the ultimate urban development.

* Ontario Ministry of Agriculture and Food, Foodland Development Branch, "Introduction to the Townsend Farm Lease Program" (unpublished document) 1976.

Each of these areas also has corresponding implications on farming tenure, which have been used as the basis for the recommended agricultural policies.

Agricultural Zones

In the Initial Development Area, which contains 200 ha (500 a), development will start in approximately one year's time. Therefore, all agricultural uses should be discontinued in this area.

The Mid-Term Development Area will cover about 200 ha (500 a) excluding valleylands and the initial development area. The agricultural land in this area will be developed for urban use over roughly the next 5 to 10 years. In this zone, agricultural production should be limited to cash crops or forage production, and strict controls on the types of farm production and operating procedures should be enforced.

Livestock enterprises in this area should be planned in a way not to constrain urban expansion; large capital expenditures for expansion of livestock operations should not be approved. Where operations cannot remain viable under these restrictions, the lease should be cancelled and options given for leasing other available units within the site. Consolidating the released unit with neighbouring farms should be investigated.

The Long-Term Development Area contains 1,800 ha (4,400 a) of farmland outside the valleys and earlier development areas. This area will undergo gradual transition from agricultural to urban use after 10 or more years. In this zone, most intensive forms of agricultural production should be allowed to continue where presently established until the expanding urbanization abuts the area, but new operations involving major capital investment should be discouraged.

Due to the low capital requirements and the ready market, 'pick your own' market gardening may be especially suitable for this zone. Nurseries are common uses between urban and rural areas, but these are unlikely to occur in this part of the site because of the relatively short recovery period on the capital investment needed. Greenhouse operations are possible if they could be incorporated within the urban area.

In the Permanent Agriculture Area, covering about 2,800 ha (6,900 a), the nature of agricultural pursuits should be virtually unrestricted. Severances for transportation routes and

utility corridors for the Townsend community should be planned well in advance. Recreational easements as part of the community or regional open space system should be restricted as far as possible to the more non-productive lands in the valleylands and existing woodlots.

Transitional Zone

All agricultural uses are not suitable in areas abutting to urban areas. The urban dweller can be subjected to odour, flies, spraying, noise and hazards to children from livestock. The farmer can suffer from vandalism, restrictions on spraying operations and manure spreading, and traffic hazards in the movement of livestock and machinery.

Intensive livestock operations are a particular source of nuisance when next to urban development. The "Agricultural Code of Practice" for Ontario provides guidelines regarding manure management and manure treatment to minimize odour problems and protect water quality.

The potential for conflict will occur primarily in a narrow band surrounding the developed area. The width of this band will vary, but would include at least all individual farm units abutting directly upon urban land. This band will gradually move as the urban area expands, until it reaches the permanent agricultural area. The various agricultural operations in this band will require careful management. (See table 6.00.)

Where necessary a permanent buffer can be developed at the limit of urban area to separate urban and agricultural uses. The permanent buffer strip is planned around the ultimate limits of the urban development. Natural wooded areas, such as those in portions of the Creek floodplains or along the backlot lines, should be included within the buffer zone where possible.

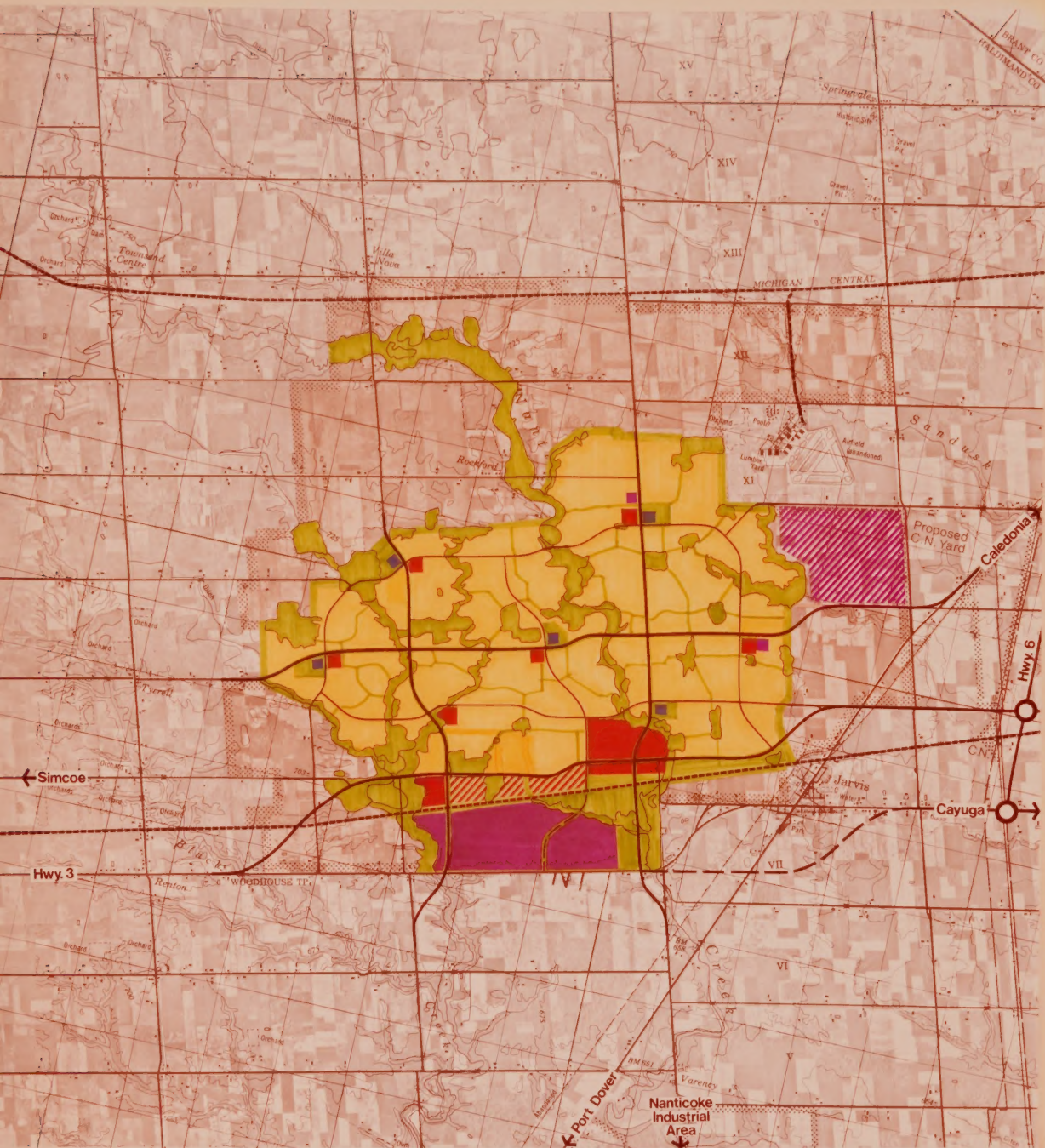
The strip will contain non-agricultural land uses compatible with the adjacent farming activity. These could include most land-intensive outdoor recreational uses, like parks, golf courses, and horse riding establishments. The strip should be extensively planted; this could provide forest resources and control erosion along water courses.

Table 6.00
Suitability of Agricultural Operations in Proximity
to Urban Development

Type of Agricultural Operation	Primary Factors Affecting Compatibility
<u>Unsuitable Operations</u>	
Intensive beef/hog/sheep operations	- odour, flies, public safety, high capital investment
Market gardening, canning orchards, nurseries	- vandalism, pesticide residues, spraying and cultivation noise levels, high labour costs, high capital investment
Poultry, eggs	- odour, high capital investment, flies
<u>Moderately Unsuitable Operations</u>	
Dairy dominant operations	- odour, high capital investment - prime marketing location
Mixed operations (dairy, livestock, cash crop)	- odour, dust
<u>Suitable Operations</u>	
Cash crops, forage	- noise problems may restrict timing of field operations - dust - low capital investment
Greenhouse operations	- prime marketing location - potential for incorporation within urban community

Light industrial development is preferable to residential, commercial or institutional development in areas where more suitable uses cannot be found.

The planting and landscaping of this strip should occur well in advance of the associated development to ensure that it has matured in time.



Strategic Plan 100 000 Population

- | | | | |
|---|--|---|--------------------|
|  | Housing Areas |  | Major Arterials |
|  | Mixed-Use Activity Centres |  | Major Collectors |
|  | Major Institutional & Educational Uses |  | Pedestrian Network |
|  | Employment Areas |  | Railways |
|  | Open Space | | |
|  | Agricultural Uses | | |



Date Sept. 76

TOWNSEND

COMMUNITY DEVELOPMENT PROGRAM



Ontario

Ministry
of Housing

Llewellyn-Davies Weeks Canada Ltd.
Peter Barnard Associates
John Bousfield Associates
De Leuw Cather, Canada Ltd.
Ecoplans Limited

